SCRAP TIRE MANAGEMENT WORKSHOP

FINAL REPORT

FEBRUARY 1992

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1.0 EXECUTIVE SUMMARY

Introduction

At the Tire Recycling Workshop, hosted by the Ministry of the Environment, and held at the Markham Suites Hotel in Markham on March 6-7, 1991, there were approximately 145 participants on the first day, and 140 participants on the second day. The majority of participants were from the business sector (tire manufacturers and retailers, manufacturers of value added products, consultants etc.) and from government (federal, provincial, municipal). Non-governmental environment groups and associations with an interest in scrap tire management were also in attendance.

Structurally the workshop was divided into three sections. The main plenary sessions allowed designated speakers, representing different sectors, to introduce participants to their sector's interests and concerns. The working sessions allowed participants to identify the issues and options they think are most relevant to scrap tire management. The reporting plenary sessions highlighted the areas of consensus and disagreement.

Recommendations

- The most immediate problem is the lack of legal storage facilities for scrap tires. Present facilities must be upgraded to ensure they are safe, and additional facilities must be created.

- To help accomplish this the Ministry of the Environment must streamline its approvals process.

- A more coordinated system of collecting scrap tires is needed. Government should regulate all haulers and storage sites.

- Tire derived fuel should be used in the short-term to deal with the province's tire stockpiles.

- Value added products are the preferred option for scrap tire management in the long-term. Incentives should be provided to help encourage research and the development of new technology. A secure supply of scrap tires needs to be assured. Government procurement policies should encourage the use of recycled products.

- The continued exploration of rubberized asphalt should occur while keeping in mind: pavement performance, recyclability, air quality, production and installation, cost vs. benefit, and market factors.

- Public education should be an ongoing process. Consumers should be better informed about proper tire care and use and those in the cycle educated on updated scrap tire management options.

- Government must seriously listen to the concerns of stakeholders.

- All stakeholders (government, industry etc.) must work more closely to implement solutions. They must also be accountable to each other.

- The tire tax should be directed to finding solutions to this problem.

RÉSUMÉ

Introduction

Les 6 et 7 mars derniers, le ministère de l'Environnement tenait un atelier sur le recyclage des pneus à l'hôtel Markham Suites (Markham). Environ 145 personnes ont pris part à la première journée et 140 à la seconde. La majorité d'entre elles provenaient d'entreprises (fabricants et détaillants de pneus, fabricants de produits à valeur ajoutée, experts-conseils et autres) et des administrations fédérale, provinciale et municipales. Étaient également représentés des groupes et organismes non gouvernementaux de défense de l'environnement s'intéressant à la gestion des vieux pneus.

L'atelier était divisé en trois volets. Au cours des séances plénières principales, des conférenciers représentant divers secteurs d'activités ont exposé les intérêts et les préoccupations propres à leur secteur. Les séances de travail ont permis aux participantes et participants de cerner les problèmes leur semblant les plus pertinents en ce qui a trait à la gestion des vieux pneus, ainsi que les solutions possibles. Les séances plénières de synthèse ont ensuite permis de faire ressortir les points faisant l'objet d'un consensus et les points litigieux.

Recommandations

- Le manque d'installations légales destinées à l'entreposage des vieux pneus constitue le problème le plus pressant. Les installations actuelles doivent être modernisées pour les rendre plus sûres et d'autres installations doivent être aménagées.

- Pour y parvenir, le ministère de l'Environnement doit rationaliser son processus d'autorisation.

- La mise en place d'un processus de collecte des vieux pneus mieux coordonné s'impose. Le gouvernement devrait réglementer les activités de tous les transporteurs et l'exploitation de tous les lieux d'entreposage.

- À court terme, on devrait recourir à la fabrication de combustible dérivé des pneus pour réduire la quantité de vieux pneus entreposés dans la province.

- À long terme, la préférence doit être accordée à la fabrication de produits à valeur ajoutée. Des programmes favorisant la mise au point de techniques nouvelles doivent être créés. Des stocks suffisants de vieux pneus doivent être assurés. La politique d'approvisionnement des gouvernements doit privilégier l'achat de produits recyclés.

- On doit continuer à explorer les possibilités offertes par l'asphalte caoutchouté, en tenant compte des facteurs suivants : durabilité du revêtement, possibilités de recyclage, qualité de l'air, production et installation, rapport coûts-avantages et débouchés.

- Des efforts soutenus doivent être déployés pour sensibiliser le public. Les consommateurs doivent être mieux informés sur les mesures qu'il faut prendre pour l'emploi et l'entretien des pneus. Les personnes qui gèrent les vieux pneus doivent en outre être renseignées sur les nouveaux procédés de gestion.
- Le gouvernement doit prêter une oreille attentive aux préoccupations des parties intéressées.

- Une collaboration étroite entre toutes les parties intéressées (le gouvernement, l'industrie, etc.) doit s'établir pour la mise en oeuvre des solutions. Ces parties doivent par ailleurs être tenues de se rendre des comptes entre elles.

- La taxe perçue sur les pneus devrait être affectée à la résolution du problème.

2.0 SUMMARY OF REPORTING PLENARY SESSIONS

March 6th - morning reporting plenary

The first working session was used by participants to identify scrap tire management options and issues which need to be resolved. Participants also used this time to vent some of their frustration over the issue.

Participants identified these options for dealing with the problem:

- controlled storage
- tire derived fuel (TDF)
- rubberized asphalt
- value added products
- artificial reefs

Participants identified these issues to be resolved:

- tire tax (accounting for the money collected and designating its use)
- need for regulations to be consistent
- lack of markets for value added products
- poor communication (between government and stakeholders/public)
- need for improved leadership and accountability from that leadership
- need for improved collection of scrap tires
- need for increased research & development
- municipal regulations
- need for a secure supply of crumb rubber
- concern about accuracy of data on scrap tires
- need for greater commitment and coordination between stakeholders
- need to reduce disincentives to 3 R's
- need for a made-in-Ontario solution

March 6th - afternoon reporting plenary

Originally the groups had been asked to identify long-term and short-term options and issues. Some of the groups felt it was not possible to make the division effectively, while those that did make the division added the category of "immediate" options and issues.

The majority of participants identified lack of legal storage facilities for scrap tires as their most immediate concern. Participants felt that secure storage areas for scrap tires should be identified, the approvals process for licensing storage facilities should be streamlined, a controlled method of collecting scrap tires should be instituted and incentives should be introduced to promote responsible tire disposal.

In the short term a majority of participants felt that tire derived fuel should be tested and used to deal with the province's tire stockpiles. The potential harm to the

environment from the storage of tires and the associated risk of fire were identified as concerns.

In the short to long term the majority of participants felt that the development of value added products should be encouraged by promoting product research, expanding existing markets, ensuring the supply of scrap tires, improving facilities for producing of crumb rubber, harmonizing regulations so there is a level playing field and having government absorb some of the risk of product development. Rubberized asphalt is seen as an option in the long term.

March 7 - morning reporting plenary

Areas of consensus among participants began to be apparent. The outline of a coordinated scrap tire management strategy began to emerge.

Points raised:

- The most immediate problem is the lack of legal storage facilities for scrap tires. Present facilities must be upgraded to ensure they are safe, and additional facilities must be created.
- To help accomplish this the Ministry of the Environment must streamline its approvals process.
- A more coordinated system of collecting scrap tires is needed. Government should regulate all haulers and storage sites.
- Tire derived fuel should be used in the short-term to deal with the province's stockpiles.
- Value added products are the preferred option for scrap tire management in the long-term. Incentives should be provided to help encourage the development of new technology. A secure supply of scrap tires needs to be assured. Government procurement policies should encourage the use of recycled products.
- The testing of rubberized asphalt should continue.
- Public education should focus on how consumers can increase the life of their tires.
- Government must seriously listen to the concerns of stakeholders.

March 7th - afternoon reporting plenary

As Drew Blackwell, ADM Waste Reduction Office, was present at this final session many participants wanted to address their concerns to him directly.

It was recommended that government:

- expedite its approvals process;
- allow a TDF test (TDF to be used in the short term to handle stockpiles);
- ensure that all stages of the scrap tire management system (e.g., collection, storage, disposal) are regulated and that those regulations are enforced;
- create a body which would coordinate the system (one group recommended a scrap tire marketing board);
- promote and fund research and development.

The following recommendations were also made with regard to improved communication and accountability:

- government must listen to stakeholders;
- the tire industry and the province should assume tire management responsibility for municipalities until economic disposal alternatives are developed
- stakeholders must work more closely to find/implement solutions;
- business must be allowed the freedom to develop solutions;
- value added products should be promoted;
- there should be greater accountability with regards to the tire tax;
- public education should focus on the different scrap tire management options and how individuals can participate;
- issue a press release outlining conclusions of workshop;
- continue dialogue between stakeholders (one group recommended a newsletter).

3.0 GROUP REPORTS

3.1 Group A

Facilitator: Mary Rowe

Participants and Process

Group A included representatives from the Ministries of the Environment and Energy, municipalities (Halton and Guelph), and various aspects of the scrap tire management industry (recyclers, end market users, manufacturers). There was no one representing an environmental organization in this group.

During the first session the group identified their concerns; first, according to their sector and, then, those that were shared by all stakeholders. The second session was spent identifying options and establishing an understanding of the time frames. During the final two sessions the group established a long - term scenario and then constructed a time line and identified what actions/measures should be taken at each point to achieve it (attached).

Options and Issues Discussed

1. Reliability of data

Many participants expressed their distrust of government data estimating the volume of scrap tires being generated. Are tires entering the waste stream at these levels?

2. Tire-derived fuel

Participants were unsettled by the remarks of the Minister's assistant offered at the outset of the workshop. Did this mean TDF was 'off the table'? Arguments favouring TDF included the availability of the technology; industry's willingness to fund the capital costs; the international competitiveness of the cement industry being threatened by other more costly fuel alternatives; and the rationale that locally controlled TDF is better than tires being exported for the same use or exported.

The consensus of the group was that TDF should be considered as a viable alternative in two ways, first, as a means of clearing the stockpiles of tires which are now too dirty to be recycled anyway. Secondly, the group felt TDF would be acceptable in the medium and longer terms for handling non-recyclables only. A participant representing the cement industry expressed his willingness to invest in TDF knowing that its use might well depreciate over the longer term.

3. Rubberized asphalt

Participants were not prepared to accept this technology as the complete solution. This option should be exercised not to hide the tire problem, but rather if it builds better roads. However, more information was needed to fully assess this option and to properly estimate what portion of the scrap tire supply could be consumed by rubberized asphalt.

4. Markets

Participants expressed a concern that, if, a recycling industry is to be fostered in Ontario, a steady supply must be maintained. This would require measures to discourage the export of scrap tires to the U.S. or other provinces. Even with that assurance some participants wondered if Ontario could service those markets once they were created. Others countered that a potentially ideal scenario was that Ontario should become a net importer of scrap tires.

Governments were seen as playing a key role in the development of markets: as procurers, as regulators, and as funders of the necessary research and development in the short - term.

5. No one wants to pay

Often it is the dealer who is stuck with the tires, and they have been unwilling to pay for their removal to a more appropriate site. Industry participants also felt that the consumer was not willing to pay for the disposal of any waste product. This reluctance is exacerbated in Ontario by the 'tire tax' being applied at the point of purchase.

Product stewardship is a hard concept for the scrap tire issue, because it is hard to determine who the generator of the scrap tire is - the firm which manufactured it (for Canada, all major manufacturers are outside the country) or the consumer who purchased it and as a result of use is now disposing of the tire?

6. Need for a Balanced Process

An equal triangle showing a balance between collection, process, and markets was the goal to strive for. As "closing the loop" (making recycled tires from scrap ones) is not technically possible, balancing the triangle is more difficult. Therefore the emphasis has to be on developing products in which vulcanized rubber is an asset.

7. Education can go a long way

Users being better informed about proper tire care could significantly reduce the annual volume of scrap tires being generated.

8. Timing

Participants acknowledged that there was an immediate need for some sort of action, but at the same time expressed a concern that government might act hastily without properly studying the alternatives.

9. Role of Regulation

Although not advocating extensive government intervention, participants felt the system would be greatly improved if everyone involved in the tire chain were licensed.

Recommendations

The key recommendation by Group A was adoption of the attached time line and measures to be taken.

In summary the group agreed on the following recommendations:

1. The approvals process by the Ministry of the Environment should be time activated to avoid untenable delays. This would include applications for funding and licensing of sites.

2. The activity of all Ontario ministries needs to better coordinated (Ministries of Environment, Energy, Transportation, and Solicitor General). Specifically, it would greatly help industry if it could be provided with one place which would coordinate contact with all the others.

3. An entity with balanced representation of government and industry should be established to lead this process.

4. The Ontario Government should establish an accountability mechanism for all of us, to ensure that we do what we say we're going to do. A report card should be issued on all sides.

5. The players need a vehicle to receive and share information - like a newsletter ("Tire Tracks").

The group prepared the following action plan, with steps marked in sequence.

Immediately (in 1991)

Step 1. A consumer ad campaign should be initiated to teach better management techniques and educational information to those who are part of the infrastructure, urging them to comply with the plan.

Step 2. Secure temporary storage areas must be established.

Step 3. The $5 tire tax should be focussed on tire management.

Step 4. A licensing system for haulers to be created.

Step 5. Establish a data base to track.

Step 6. Conduct the test burn for TDF.

Step 7. Industry must move ahead to design, develop and eventually manufacture end-use products.

In the Short Term (By Jan 1, 1994)

Step 8. Provincial and municipal governments should adopt procurement policies for products made from recycled rubber, immediately.

Step 9. Rubberized asphalt research and testing programs should be completed as soon as possible. If found to be environmentally-sound, practical, cost-effective from a societal perspective and not to the detriment of the provinces pavements, the Ministry of Transportation should approve the use of rubberized asphalt.

Step 10. Measures should be taken to preserve the supply and discourage exports.

Step 11. Industry (manufacturers and retailers) should promote and advertise the purchase of recycled and reused products, using voluntary guidelines they have developed.

Step 12. Pending favourable results from the test burn, tire derived fuel should be used in the short - term to deal with stock piles and only for non-recyclables after that.

Step 13. Industry to accelerate its research and development efforts to manufacture value added products (vaps).

In the Long Term (after 1994)

Step 14. If industry efforts have been successful, the demand for vaps will have replaced the need for government to subsidize technology and/or product development.

Step 15. Government policy should favour mass transit over automobile use.

Step 16. Rubberized asphalt will be phased out to provide a supply for vaps.

Step 17. Environmental concerns with respect to scrap tire management will have been resolved.

Step 18. Tire derived fuel will be used only for non-recyclables.

Step 19. The tire tax will be eliminated.

Finally, the group felt that implementation of this action plan would result in scrap tires being considered a resource rather than a waste, and that Ontario would become a net importer of scrap tires and an exporter of vaps containing vulcanized rubber.

3.2 Group B

Facilitator: Denis Lefebvre

Participants and Process

Group B consisted primarily of industry and government representatives. Industry was represented by manufacturers of tires, new product developers, haulers, and researchers, and government representatives were from the federal, provincial and municipal levels. Also present were consultants and a representative from a non - governmental organization.

The group started the first session by identifying issues that should be considered in scrap tire management in Ontario. They went on to discuss the pros and cons of various options. There was much heated debate, disagreement, and a general need to vent frustrations. The group quickly came to the conclusion that there was no need to define the long and short - terms for purely academic reasons but that there was an immediate need to address the actual on-going generation of scrap tires and how they can be used for their material recovery value. On the second day, the main priority brought forward was the immediate need to get rid of what is presently being generated and the alternatives available to do that. The group went on to discuss who would be responsible for what activities. During the last afternoon session, they developed two main points to report on during the final plenary.

Options and Issues Discussed

In the context of the three Rs (but without forgetting about the fourth!) the group discussed the following issues:

- the on-going generation of tires
- controlling the flow of tires in the system
- the collection and hauling of used tires
- the volume of used tires
- markets for value added products from scrap tires
- the present disposal/storage of tires: leachates, standards, future accessibility
- research and product technologies, recycling tires into tires
- carbon asphalt testing
- commitments and cooperation on the part of industry, retail and all levels of government

- accountability
- economics
- incentives at all levels
- export/import

With so many divergent interests to be expressed, the group managed to discuss the pros and cons of four options in some detail and identify two others. They are:

- Controlled storage:
  - pros
    - centralized
    - material available for future use
  - cons
    - Hagersville-like situations
    - the publics'willingness to put up with the site
    - cost of getting tires in and out
    - no system of incentives for collection
    - temporary solution
    - cost of maintenance
    - inexpensive option with which more expensive technologies cannot compete
    - cleanliness of tire for future use (disagreement)
    - methane gas (disagreement)

- TDF:
  - pros
    - short term solution
    - known technology
    - offsets conventional technology
    - economics
  - cons
    - discourages recycling
    - not part of OMOE's three Rs
    - emissions/pollution

- Crumb rubber:
  - pros
    - recovers the materials value
  - cons
    - few markets
    - cost of reprocessing
    - energy consumptive

- Controlling the flow:
  - pros
    - creates more interest for solutions to the problem
  - cons
    - could lead to illegal disposal

- Dedication of the Tire Tax

- Incentives

On the second day, the group re-focused its discussion and set its number one priority as the management of the scrap tires being generated presently. They felt this could be addressed by three alternatives:

1. Creating value added products
2. Using rubberized asphalt
3. Tire Derived Fuel

Recommendations/Solutions

The group discussed who should be responsible for what activities in scrap tire management. The four main points were:

- Industry solves
- Business/Retail collects/controls
- Government regulates/enforces
- Public/Users pay

Industry/Business/Retail should develop proposals and implement acceptable practices for the collection, processing and marketing of scrap tires. It should also play an educational role.

Government should license centralized depots capable of accepting current generation of used tires. It should license and enforce haulers. It should account for the tire tax. It should address procurement policies. It should also play an educational role.

The Public/Users should continue to pay. They should not short circuit the system by illegally disposing of tires.

The two main points the group wanted to make were:

> Do not close the door on TDF. Look at it as a short - term solution. Do not allow dedicated facilities or dependencies to be built on it. Allow those who want to create value added products to have the first opportunity to use the tires. Build in a sunset clause that forces review of the situation periodically.
>
> Control the flow of tires. Tires should be auditable throughout the tire chain - manufacturer»retailer/wrecker»hauler»storage/processor»markets. Regulations and their enforcement are equally indispensable.

3.3 Group C

Facilitator : Sandra Curtis

Participants and Process

The composition of this group was quite diverse, with approximately half of the thirty group members coming from business-related fields including tire manufacturers, recyclers, and consultants. Various provincial ministries and municipalities were also represented. In addition, there was one representative of an environmental group.

The first session was somewhat free-flowing, which allowed many around the table to exchange ideas. Towards the end of the time period, it was fairly easy to identify issues of concern.

The afternoon session focussed on identifying issues for short and long-term action plans. The group initially found this task difficult as many expressed their desire to deal with immediate crucial concerns. However, as the session drew to a close the group developed preliminary short and long-term action plans.

On day 2, a consensus was achieved on the more specific immediate, short and long-term strategies.

The last session served as a summary opportunity. Salient points were listed to be raised with Drew Blackwell, ADM, Waste Reduction Office.

Options and Issues Discussed

Safe/Legal Collection and Storage of Tire Piles

An immediate concern is to establish the safe destination for the ongoing generation of tires and to secure existing sites that meet current regulations. Coupled with this is the remediation of existing unsafe tire piles. The question of NIMBY was raised and to what extent the public is allowed to participate and dictate when sites are chosen and proponents try to get approvals. There was discussion about the need for more legislation surrounding the collection of tires concerning the effectiveness, need and practicality. Although not fully endorsed by all group members, TDF was generally accepted as a short-term solution to the existing scrap tire problem. It was also noted that the subject of TDF should also contain that of oil and carbon as products derived from the processing of whole tires.

Leadership/Accountability

The "politics" involved in the licensing format, approval process, and definition of wastes caused concerns among some participants. Strong leadership and accountability were felt to be missing on the part of government. A sense of responsibility sharing was acknowledged, but a real need was identified for government to play a quarterbacking role.

Economics

An economic cost-benefit analysis should be carried out. Is the Tire Tax being put to best use? Would a deposit system encourage more product stewardship, a cradle to grave approach among industry members? Incentives and subsidies, and R&D grants for new and improved technologies are necessary. Private firms in particular need to be encouraged and funded by various government agencies as well as private or corporate arrangements. With the current lack of market demand for scrap tire derived materials in our country, new markets must be developed.

Communication

Public education needs to be ongoing. The public needs to be informed of what is required for managing scrap tires and what they can do to help. Communication is a shared responsibility among all levels of government, industry, environmental groups, media and the public. The long-term goal for a clean, safe environment requires effort and accountability from all sectors.

Recommendations

- In Group C, business sector representatives, in particular, expressed the URGENT nature of their concerns and the importance of being heard by an openminded government.

- Given the shortage of safe, legal destinations for the millions of scrap tires in Ontario, the MOE should utilize TDF as an immediate solution to the growing tire piles.

- Current legislation should be reviewed with respect to the controlling and licensing of the tire collection network. The approvals process for scrap tire storage and processing sites needs to be streamlined.

- Homemade problems require homemade solutions. Solid provincial leadership will ensure a strong, self-sufficient tire industry which is economically competitive and not dependent upon export markets.

- Monies generated from the Tire Tax should be given back to industry and ultimately to the consumer for the purpose of furthering R&D projects and developing new technologies, controlling the flow of tires and paying for storage and management.

- REDUCE through more public education. REUSE by government and industry purchasing more retreads. RECYCLE with increased subsidies and incentives, on-going support for product uses, purchasing of new products and developing markets. RECOVER through TDF approval used in a controlled fashion as a short-term solution.

- The OSTTF should be expanded to include more community groups. It should serve as a fast track process for gaining access to senior levels of government.

3.4 Group D

Facilitator: Peter Oliphant

Participants and Process

Group D included representatives of two environmental advocacy groups, the trucking, automotive and tire industries, cement manufacturers, other actual or potential recyclers of used tires, and local, provincial and federal government departments. A list of the participants is appended to this report.

The workshop began with a review of each participant's initial position on the tire recycling question. The four areas evoking the greatest interest were:

- Emphasis on the "Three R's" - Members were eager to find long-term solutions to the scrap tire accumulation problem that would give priority to reduction, reuse or recycling over TDF, landfilling or incineration.

- Short-term need for TDF - Only one of the environmentalists spoke against TDF in cement manufacturing; reasons were reviewed in a speech on the morning of the second day of the workshop. Many of the others felt that TDF was the only solution to reducing the vast amounts of scrap in the short-run.

- Concern over administration - A number of members felt that the government had reacted too quickly to the Hagersville fire. Words such as hysteria and paranoia were used to describe behaviour that blocked a thoughtful response. The result was cumbersome approval processes under regulations that precluded comprehensively dealing with the problem. As an example, members commented on the delays in approving stockpiles of more than 4,999 tires as raw material for recycling processes that require a throughput of 10,000 tires a day to be economically feasible.

- Tracking the flow - Almost everyone felt the need for a better understanding of tires' progress from manufacture to disposal. An easy way of doing this would be to work with the relatively few chains of outlets that handle most of the new and used tires.

During the four sessions, Group D tried several times to distinguish long and short term strategies, but was unable to do so. Instead, the group felt that the solution to getting rid of accumulated and accumulating stockpiles had to be different from, and was more pressing than, managing future flows of tires.

Options and Issues Discussed

In an effort to identify recommendations needing detailed amplification, the discussion of options and issues ranged widely. Some proposals are mentioned above: others included:

- Manufacturing for re-use - Tire makers could pay more attention to what will happen to their product when it has outlived its original purpose. Tires could be made in anticipation of disassembly or return for refabrication into other uses. It was felt that the manufacturers have the best developed understanding of the characteristics of their product and are thus in the best position to anticipate its potential.

- Crumbing for asphalt - Crumbing for inclusion in asphalt was felt to be a less-than-perfect short term solution. Its only result might be "linear landfill", leading to inferior pavement or a greater use of asphalt than is environmentally desirable.

The discussion then turned to trying to classify the options and issues that had been mentioned in a simpler way. Four categories of concern emerged:

- Government, with power to tax, approve, set policy, monitor, support through incentives, and provide storage of used tires.

- Market development

- Export

- Processing

Market development seemed to offer the most opportunities for future use of scrap tires. The group ranked three market areas in order of importance for the discussion: fabricated products, asphalt and TDF.

In the ensuing discussion on market development, the group considered the problems in developing technologies for:

- Substitution of used rubber for other components in already manufactured products, and for

- Creating new products.

Ways of encouraging these options were:

- Education of manufacturers and the public;

- Government procurement policies designating levels of used rubber to be included in purchased materials;

- Incentives to allow crumb to be delivered at a reasonable price to those manufacturers who could convert it into usable products; and

- Incentives to research within the National Research Council and the universities.

There was a great deal of discussion around how the $5 tire fee might be allocated for these purposes.

Recommendations/Action Plans

In the light of the complexity of the subject and the need to develop a balanced policy, the group concluded that it should recommend the formation of a "Scrap Tire Marketing Board" (STMB). The Board would regulate, license, monitor and coordinate tire movement, and would provide incentives for research and manufacturing.

The priorities of the Board should include:

- Act quickly to develop "emergency use permits" to fast track approvals where positive contributions to solutions appear probable. Considerably more discretion should be permitted than under current regulations, provided no decisions were made that would compromise security.

- Develop short-term planning and control mechanisms, and establish a long-term planning process.

- Clarify definition, establish storage requirements, and encourage/support compliance with policy, using co-insurance charges to share the burden of financing stockpiling.

- Educate - in schools and through public advertising.

The Board should consult widely, and, in common with other boards and commissions, should include members who are paid to discharge their responsibilities.

3.5 Group E

Facilitator: A.J. Finlay

Participants and Process

There was a good representation of stakeholders in Group E, including a strong presence from government and levels of industry - manufacturers, distributors and processors. There was some representation from municipalities, environment and consumer groups.

Group E followed the suggested process for discussion; however, there were times when members expressed their frustration with government policy and process. The group strongly expressed a wish that their concerns be heard.

Session 1: The group listed options for scrap tire management. Five options were chosen for detailed discussion on "pros and cons" - tire derived fuel, crumb rubber products, rubber asphalt, landfill and artificial reefs.

Session 2. A time frame for short and long-term action was discussed. Criteria were established as follows:

1. Cost effective
2. Product quality
3. Environmental concerns satisfied
4. Scale - quantity
5. Public acceptance
6. Sustainable
7. Technical feasibility
8. Awareness/education
9. Political acceptance
10. Compatibilty
11. Markets

The previous list of options was categorized as short or long-term. Four long-term options were chosen, the criteria were checked and requirements listed. The four options were - TDF, crumb rubber products, rubber asphalt and artificial reefs. It was decided that long-term options should be cost effective and self-sustaining.

Session 3. The group brainstormed action plans that could begin immediately or in the short-term. Action plans were listed in order of priority. The requirements to make these options work in the short-term were discussed.

Session 4. The listing and discusson of short-term action plans continued. The group concluded by briefly considering the responsibilities that

government and industry could take on to work cooperatively on the scrap tire management issue in Ontario.

Options Identified

- Tire Derived Fuel
- Crumb rubber products
- Rubber Asphalt
- Artificial Reefs
- Other products e.g. building blocks
- Stockpiles
- Breakdown to virgin components
- Retreading
- Landfill
- Export for beneficial use
- Distribution centres

Criteria was established in **Session 2.**

Action Plans and Recommendations
(Listed in order of priority for action)

1. Education and Awareness:

There is an immediate need to raise public awareness around the issues and options for scrap tire management. Educational information could come from government, industry and environment groups.

2. Fast Track the Process:

In order to expedite the approval process and regulatory changes, it is suggested that stakeholders have a stronger advisory role for government. This could be done by revitalizing the tire task force to include a broader input from manufacturers, distributors, processors, consumers and environmental groups. This task force would need ongoing access at a higher level of government than it has currently. It should meet very soon with the minister to make a balanced presentation of concerns.

3. Safe Storage:

There is a need to expedite approval of storage sites and to offer incentives for safe storage. It was suggested that the form of tire be changed by compacting, split and baling or shredding. It was recommended that there be financial assurance for re-use of tires.

4. Collection:

An infrastructure, with a minimum of bureaucracy, needs to be set up for organized collection of tires. A system for tracking tires was suggested as well as financial assurance for re-use.

5. Regulatory Changes:

To speed up the process, it would be important for the government to clarify and change regulations that are impeding action. A simple system of licensing and fees could better control scrap tire traffic. Manufacturers of rubber crumb products would find it helpful if regulations for product quality were based more on performance than content.

6. TDF Test Burn:

The group agreed on a TDF test burn. Most saw Tire Derived Fuel as a feasible short term solution to current scrap tire stocks with a "sunset" provision. Some suggested more attention be given to research information from other countries. For long term uses, political and public acceptance would require frequent environmental testing and cooperation with reduction (3R) options.

7. Crumb Rubber and Other Products:

This was seen as a favourable use of scrap tires. There is a need for market development and a steady, local supply of scrap tires. Increased financial assistance would be needed for ongoing research and development to ensure good quality products.

8. Rubber Asphalt:

Ongoing research and development is needed to determine the quality of rubber asphalt as compared to conventional road building methods and new technology in the field. It is important to monitor rubber asphalt projects in other countries.

9. Artificial Reefs:

More R&D is needed to determine whether scrap tire reefs are successful as aquatic spawning grounds and whether there is a negative effect on the quality of water in the area. A consistent policy between government ministry departments would be helpful to proceed with this project. If this became a long-term non-commercial project, it would require ongoing volunteer support.

Roles for Industry and Government:

Industry:

Industry could assist with balanced educational information about scrap tire options. Industry could also assist with public relations and market development. Ongoing research and development and other technical support would be difficult in Ontario and Canada, because most R&D is done out-of-country with parent companies.

Government:

An overall government strategy is needed to coordinate scrap tire management in Ontario. This could include a re-vitalized advisory board of stakeholders as suggested previously. Government could educate and raise public awareness of the issues and options around scrap tire management. In developing markets, government could encourage the public and government departments to buy recycled rubber products. Financial assistance for on-going R&D, product development, safe storage, etc. would be necessary. Some felt it would be helpful for government to define scrap tires as a resource or a waste. There was emphasis on the need for government to speed up the approval process.

APPENDIX A

SCRAP TIRE MANAGEMENT WORKSHOP AGENDA

DAY 1 - Wednesday March 6, 1991

8:30	*REGISTRATION/BREAKFAST* **Foyer**
9:00	INTRODUCTION AND WORKSHOP OBJECTIVES **Location: Ballroom C**
9:10	OPENING REMARKS Joyce McLean - Special Assistant, Policy Office of the Minister of the Environment
9:20	PLENARY SESSION "The Challenge of Scrap Tire Management In Ontario" Neal Ahlberg, Ministry of the Environment Felix Pilorusso, Pilorusso Research Associates Inc. • Scope of problem • Management Options • Constraints
10:00	*BREAK* **Foyer**
10:15	CONCURRENT WORKING SESSIONS: **Locations: Group A-Butternut, Group B-Holly, Group C-Jasmine, Group D-Evergreen, Group E-Maple** Identification of key issues to be resolved
11:30	REPORTING PLENARY: **Location: Ballroom C** Consensus and points of disagreement on key issues to be resolved
12:15	*LUNCH* **Location: Ballroom A&B**
13:30	PLENARY SESSION **Location: Ballroom C** Technology and Markets: Options & Constraints Terry Gray - T.A.G. Tony Holland - CVL Products Rolf Huber - Sportbau Canada Carl Katz - National Rubber

Gary Mottershead - Recovery Technologies Inc.
Fred Svirklys - Domal Enterprises
Barry Takallou - BAS Engineering

15:00 *BREAK*
Foyer

15:15 WORKING SESSION:
Locations: Group A-Butternut, Group B - Holly, Group C-Jasmine, Group D-Evergreen, Group E-Maple
- Divide issues into short-term and long-term
- Identify essential components of a long-term strategy

16:30 REPORTING PLENARY:
Location: Ballroom C
Long term strategy: identify consensus and disagreement

17:00 *RECEPTION - Cash Bar*

DAY 2 - Thursday, March 7, 1991

8:15 *BREAKFAST*
Location: Ballroom A

8:45 *DAY ONE RECAP* - Summary of Conclusion
Location: Ballroom A

9:00 PLENARY SESSION:
Location: Ballroom A
The Feasibility of Implementation: accomplishment to date in 3R tire management and how much further we can go
Paul Hyatt - Ontario Tire Dealers Association
Roman Martiuk - Regional Municipality of Waterloo
Peter Martyniuk - Canadian Auto Recyclers
David Morgan - Rubber Association of Canada
Ellen Schwartzel - Pollution Probe

10:15 *BREAK*
Foyer

10:30 CONCURRENT WORKING SESSIONS:
Locations: Group A-Primrose, Group B-Violet, Group C-Orchid, Group D-Butternut, Group E-Holly
- Re-examine feasibility of long-term strategy
- Identify essential components of short-term strategy
- Identify roles and responsibilities

- How to allocate costs

11:45	REPORTING PLENARY: **Location: Ballroom C**
12:15	*LUNCH* **Ballroom A&B**
13:15	WORKING SESSION: **Locations: Group A-Primrose, Group B-Violet, Group C-Orchid, Group D-Butternut, Group E-Holly** Devoloping short-term strategy consistent with long-term
14:30	*BREAK*
14:45	REPORTING PLENARY: **Location: Ballroom C** Short-term strategy integrated with long-term
16:00	*CLOSING REMARKS & THANKS*

APPENDIX B SCRAP TIRE MANAGEMENT WORKSHOP - PARTICIPANTS

March 6-7, 1991

Rod Adams
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SCRAP TIRE MANAGEMENT WORKSHOP - PARTICIPANTS

March 6-7, 1991

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March 6-7, 1991

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APPENDIX C

Scrap Tire Management In Ontario
Ontario Ministry of the Environment
Tire Recycling Workshop
March 6 & 7, 1991

1.0 Scrap Tire Management in Ontario Workshop

The purpose of the workshop is twofold:

- to provide the opportunity to discuss long term and short term strategies to deal with scrap tires;

- to provide the opportunity to discuss how to implement the long term and short term management options for scrap tires.

This paper provides a brief background and outlines activities that have been implemented and that need to be implement. Comments and view-points should be brought forward with respect to the future of scrap tire management in Ontario to fulfil both short and long term strategies.

Throughout this workshop we must consider what we, as individual and cooperative stakeholders can do, to implement the required solutions.

It is hoped that the workshop will foster an ongoing dialogue between all stakeholders so that the tasks and opportunities are well defined. An understanding of the needs, capabilities and constraints of each stakeholder must be identified to develop successful solutions.

2.0 Introduction

Waste generators in Ontario are recognizing that managing the majority of their wastes through landfilling is no longer acceptable. This form of waste management was commonly accepted because of its simplicity and low cost. The consequences that this approach could have on the environment were not fully understood and it was assumed that the environment could provide a limitless supply of natural resources.

Rapid growth in population and economic activity has resulted in ever increasing quantities of wastes. In the past, the availability of landfill capacity was seldom a matter of concern for such growth, but waste management is increasingly becoming an issue.

Total waste generation rates per capita have risen by an estimated 25% in urban areas over the past ten years. This rate of growth is now straining our waste management systems to a point where major new efforts are required to manage the waste problem.

It is estimated that 160 landfills across Ontario have less than 2 years of approved capacity remaining. In addition, the approval of new sites is more difficult because approval requirements are increasingly more stringent. The public is demanding alternatives to disposal, and is resisting plans to locate landfills in their neighbourhoods.

The management of scrap tires is closely linked with Ontario's overall management of waste. The lack of landfill space is driving municipalities to extent site life by banning specific materials such as wood waste, paper and scrap tires from their landfills. The stockpiling of scrap tires in uncontrolled sites poses potential environmental hazards. These potential hazards became reality in February, 1990, during the Tyre King fire near Hagersville, Ontario.

Prior to the fire, the majority of scrap tires were disposed at landfills or stockpiled at various sites throughout the province. The tipping fees at these sites were very low and the controls on these stockpiles were minimal or even non-existent. It was economically attractive for scrap tire generators to choose disposal options rather than 3R (waste reduction, reuse and recycling) options. There were few incentives for industry to find economically and technically viable end markets for products containing rubber from scrap tires.

Today, our awareness of the importance of protecting our environment and conserving our natural resources is forcing us to fully integrate the 3Rs as part of any comprehensive waste management system.

It is the goal of the Ontario Ministry of the Environment (OMOE), through its policies and programs, to change from a disposal based scrap tire management system to one that is based on the 3Rs.

3.0 Background

3.1 Generation Rates:

Ontario generates approximately 8 million scrap tires per year. This consists of 6.8 million passenger tires and 1.2 million truck tires. The distribution of scrap tires by OMOE region is as follows:

OMOE Region[1]	Passenger Tires	PTE[2]	Disposal Cost[3]
Central Region:	3,273,000	5,939,000	$1.27
Northeastern Region:	227,000	603,000	$0.34
Northwestern Region:	166,000	385,000	$0.18
Southeastern Region:	821,000	1,645,000	$0.80
Southwestern Region:	1,273,000	2,431,000	$0.69
West Central Region:	1,053,000	1,662,000	$0.71
Totals:	6,813,000	12,665,000	

[1] See Appendix A for a list of Counties and Regional Municipalities by MOE Region.

[2] In terms of passenger tire equivalents (PTE), the province generates approximately 12.7 million PTE's (one truck tire equals approximately 5 passenger tires). The majority of the tires are generated in the southern part of the province with approximately 48% generated in Central Region alone.

[3] Based on 1989 figures, the average cost incurred by tire dealers for handling scrap tires, in dollars per passenger tire.

Prior to the Tyre King fire, approximately 60% of all scrap tires went to landfills, 25% went to reuse and recycling, 10% went to stockpiles and the remainder went to export and other uses. The Tyre King fire and the changes to the Ontario laws dealing with the management of scrap tires, have reduced the number of scrap tires going to stockpiles. In addition, the cost of handling and managing the tires has increased.

3.2 Scrap Tire Management Options:

The most common management options for scrap tires are landfills, reuse/retreading, recycling, stockpiles, export, tire derived fuel (TDF), and other miscellaneous uses. Scrap passenger tires have been primarily discarded as valueless waste materials, with a small portion being reused or recycled. A brief description of each option follows:

Landfills: The disposal of scrap tires by burying them on land, separately or with other waste, under controlled conditions at approved sites. This includes the compacting of the tires into cells and covering them at regular intervals. The disposal of tires in a landfill takes up valuable space and makes no further use of the scrap tire.

Reuse: This applies to all scrap tires that are sold for use as a tire. In Ontario, approximately 14% of scrap passenger tires are resold. The resale of tires reduces the demand for

new tires, however another management option is still needed once the tire is scrapped.

Retreading: (a form of reuse) Attaching new tread to a scrap tire for resale. Very few retreaded passenger tires are sold in Ontario. On average, approximately 60% of heavy truck tires are retreaded for sale. The retreading of tires reduces the demand for new tires, but again, another management option must be used to manage the tire after it can no longer be retreaded and is scrapped.

Recycling: The separation of materials from scrap tires to meet end market requirements for value-added products. Presently, only 10% of scrap tires are recycled. The main barriers to recycling have been unfavourable economics and the lack of viable end markets for the recovered materials. The cost of disposal limits the maximum fee that a recycler can typically charge for the scrap tires. In the past, these tipping fees have been too low to support recycling.

Stockpiles: The piling of scrap tires above ground, with no cover material, as a permanent storage site or for future recycling, in anticipation of end markets. In the past, most stockpiles became nothing more than above ground landfills and potential environmental hazards. The condition of some of the scrap tires at these sites may be unacceptable for use in recycling options without preparation work, such as washing.

Export: Any tire that is shipped outside of Ontario's borders for disposal, stockpiling or other end use and does not return to the province. For example, scrap tires that are shipped to a retreader and then sold out of province are considered exported.

Tire Derived Fuel (TDF): The shredding of tires into uniform pieces for use as a fuel supplement in a combustion process. This option is a one time use of the scrap tire and recovers the energy value of the tire. The most common markets for TDF have been cement kilns and stoker fired power boilers.

Other Uses: Includes tires that are used for erosion control, barriers, and any other scrap tires that are not accounted for in other options.

4.0 Tire Manufacturing Industry

The Rubber Association of Canada is a national trade association whose function is to represent the interests of Canadian manufacturers of tires and other rubber products. The tire manufacturing industry has made significant advancements in tire technology which reduced the number of scrap tires generated. For example, the tread life of a passenger auto

tire has tripled over the past 20 to 30 years. However, the advancements, such as the steel belted radial tire, that have increased the durability and safety of the tire have also made it more difficult to manage once its usefulness has ended.

In the fall of 1988, the Rubber Association formed the Task Force on Scrap Tire Disposal. The Task Force was given a mandate of investigating and reporting on the scrap tire problem in Canada. In May, 1989 the Task Force presented a report entitled Scrap Tires in Canada. The main conclusions of the report were:

- that reuse and recycling processes will optimistically divert less than one-third of the scrap tires generated from disposal;

- the development of tire derived fuel offers a potential short term solution to Canada's scrap tire issue.

In the fall of 1989, the Rubber Asscciation of Canada, along with the Ontario Tire Dealers Association, met with the Ontario Ministry of the Environment (OMOE) to discuss how the private sector could help manage the scrap tire problem in Ontario. It was decided that an Ontario Scrap Tire Task Force, a multi-stakeholder group to include industry, government and environmental groups, be established to facilitate solutions.

The OMOE undertook a study in January, 1990 to document the flow of scrap tires in Ontario and expanded on the Rubber Association's study. The OMOE study also provides a detailed background of scrap tire management in Ontario. The Ontario Scrap Tire Task Force acted as the steering committee for the study. This study represented a cooperative effort between industry, government (municipal and provincial) and the environmental community and identified a variety of technical and legislative approaches and options that can be pursued.

5.0 Changes in Ontario Laws

The province of Ontario has recently made changes to the Environmental Protection Act, Regulation 309 (General - Waste Management) under the Environmental Protection Act, and to the Ontario Fire Code under the Fire Marshals Act. These changes were made shortly after the Tyre King fire in February, 1990 in recognition of the need to strengthen legislation to secure and clean up tire sites.

5.1 Environmental Protection Act:

The Environmental Protection Act was amended through Bill 220, in June, 1990 to prevent automatic stays of ministry orders that are being appealed, to allow the ministry to carry out

the order even if a stay is granted, and to allow the ministry, in the event it wins the appeal, to recover the cost of the work from the unsuccessful appellant.

This change gave the Ministry of the Environment the power to take appropriate action when the judicial process prolongs a threat to the environment or to the health and safety of Ontario residents.

5.2 Regulation 309 (General - Waste Management):

Regulation 309 under the Environmental Protection Act was amended to require that all disposal and incineration sites and other sites that store or manage scrap tires in excess of 5000 tire units (one tire unit equals 12 kg) need Ministry approval under Section 27 of the Environmental Protection Act.

This change ensures that all large scrap tire sites (over 5000 units) and all waste disposal sites where tires are buried or incinerated, regardless of the quantity of tires on the site, and whether or not recycling takes place, require certificates of approval under Part V, EPA. It is possible that approval under the Environmental Assessment Act may be required, depending on the capacity and environmental sensitivity.

5.3 Ontario Fire Code:

The Ontario Fire Code of the Fire Marshal's Act was amended by adding a separate subsection in the code that deals specifically with outdoor tire storage yards, containing whole or shredded tires, where the bulk volume of stored product exceeds 300 cubic meters (100m^2 by 3m high). It specifies such items as fire safety planning, pile dimensions and clearance, fire department access, fencing and water supply.

This change strengthens fire prevention measures, requires improved site access, enables improved on-site fire fighting measures and provides greater security for the storage yards.

6.0 Ministry of the Environment Scrap Tire Management Activities

6.1 Enforcement:

The Operations Division[4] of the Ministry of the Environment is ensuring that all scrap tire sites are in compliance with existing environmental laws and the new changes in these laws. The Operations Division is identifying existing sites that require approvals, and is processing approvals applications.

The Ministry of the Environment's objective is to protect the environment. Therefore, Operations Division has arranged

security for private sites until Certificates of Approval have been issued. This is viewed as an effective precautionary measure to reduce the likelihood of fires until such time as site owners come into compliance with Ministry orders and certificates. Operations Division is also working with the Fire Departments to achieve compliance with the Fire Code.

This Division is the operations and program delivery arm of the Ministry. It is responsible for delivering programs to protect air quality, to protect surface and ground water quality and quantity, to manage the disposal of waste, to ensure an adequate quality of drinking water and to control the use of pesticides. The Division also has an investigative and enforcement function to ensure compliance with environmental laws.

6.2 Scrap Tire Sites Update:

Actions by the Fire Department and the OMOE have led to 44 sites removing scrap tires so that there are less than 5000 on each site. On January 24, 1991 there were 52 sites with more than 5000 scrap tires, totalling approximately 4 million tires. Approximately one-third of the sites already have Certificates of Approvals and 60% meet the requirements of the Fire Code. A site must meet the Fire Code before it is certified by the Ministry.

The remaining sites are either: i) new sites that are beginning the process of inspection and compliance, ii) sites with minor violations, iii) sites with Certificates of Approvals with compliance dates, or iv) sites that have Notices/Orders issued or being processed.

Many sites are experiencing difficulties in complying with the provisions of the Fire Code and Certificates of Approval. Site owners are faced with a lack of funds, a lack of recycling and disposal facilities accepting scrap tires, or have insufficient site area to allow pile separation or water storage to comply with the Fire Code.

6.3 Tyre King Site Update:

The Operations Division's West Central Region is responsible for the clean-up activities at the Tyre King site. This includes handling surface water, groundwater, water treatment, oil and contaminated solid waste.

Surface Water - Some surface water from the site escaped into Sandusk Creek in the early days of the fire. Surface water run-off and water from the shallow aquifer has continued to improve in quality. This is attributed to the site clean-up operations.

Groundwater - Contaminated oil sank into the ground to depths of less than 10 feet, contaminating groundwater in the shallow aquifer. There has been no impact to date on the domestic wells in the area as a result of the fire.

Water Treatment - Both surface water run-off after rainfall and groundwater from the shallow aquifer are being collected, and either stored in on-site ponds and lagoons or trucked to an isolated cell of the Townsend sewage lagoons. Approximately 6.5 million litres of the contaminated water were treated by the emergency water treatment plant and 12 million litres have been trucked to Townsend lagoons. No excess water was generated at the site during the summer.

Oil - Approximately 600,000 litres of oil mixture was collected and is currently being disposed at a hazardous waste disposal facility.

Contaminated Solid Waste - Soil from the site is non-hazardous but most soil will require treatment and/or disposal. Approximately 55,000 unburnt tires from the site were removed as part of the Regional Municipality of Haldimand-Norfolk rubber asphalt demonstration project which was funded by the Ministry of the Environment.

The clean-up of the site is continuing daily. Surface water drainage is being changed to isolate clean water from contaminated soils and water. Clean earth fill is being trucked to the site. A conceptual plan for the remediation of the groundwater is being developed by the Ministry. It is expected that approximately 90% of the site surface should be remediated by May, 1991.

6.4 Approvals Process:

The following is a brief summary of the steps that are required to obtain a Certificate of Approval under Part V, EPA.

1) The applicant must complete an application for a waste disposal site (processing/transfer station) and submit it to the OMOE's regional or district office for processing.

2) The office will review the application and contact the local municipality, property owners and any interest groups to solicit their concerns or comments on the project and the need for a hearing.

3) Based on the information received under step 2, the Regional Director decides whether a discretionary hearing is warranted. If a hearing is not required, the regional office processes the application and prepares the Certificate of Approval.

4) If a discretionary hearing is required, the Regional Director recommends to the Director of the Approvals Branch that a hearing under Section 32 of the EPA be held.

5) The application goes to the Approvals Branch and a public hearing is set for the project. The Hearing Board holds the public hearing and makes the decision on whether the project proceeds or not.

6) The decision is subject to an appeals process and if everything is acceptable, the Approvals Branch prepares and issues the Certificate of Approval.

It is possible that approval under the Environmental Assessment Act may be required, depending on the capacity and environmental sensitivity of the project.

6.5 Ontario Scrap Tire Task Force:

The Ministry of the Environment established the Ontario Scrap Tire Task Force (OSTTF) in October, 1990. This was in response to the tire manufacturer's efforts to work with government to find solutions for scrap tire management in Ontario.

The Task Force is composed of representatives from the tire industry, including the Ontario Tire Dealers Association, the Rubber Association of Canada and the Canadian Automotive Recyclers, as well as municipalities, the environmental community and the Ministry. The Terms of Reference for the Task Force are:

* to develop specific balanced action plans for short and long term solutions;
* to assist the MOE in the development of options for scrap tire management, which include regulatory, financial and technical aspects;
* to act as a steering committee for studies;
* to provide technical support;
* to exchange information and to stimulate market development of secondary uses and products.

6.6 Scrap Tire Management in Ontario Report:

This report was prepared for the Ministry with the OSTTF acting as the steering committee for the study. The report has been published and is available from the Ministry. It covers current scrap tire management practices in Ontario, processing technologies to recycle tires into other products, scrap tire management programs and practices in other jurisdictions and an analysis of policy options that will promote the 3Rs in dealing with the management of scrap tires.

7.0 Tire Recycling Program

The Ministry of the Environment introduced the Tire Recycling Program to encourage and assist the implementation of a scrap tire management system that is based on the 3R options. The Program is divided into the following five components:

1) Capital funding for tire recycling plants;

2) Research and development of technologies and market development;

3) Securing and eliminating stockpiles;

4) Establishing a collection and sorting infrastructure;

5) Underwriting the use of recycled rubber in asphalt.

7.1 Capital Funding for Tire Recycling Plants:

The Ministry of the Environment will continue to provide financial assistance to the private sector for the implementation of projects that divert waste from disposal. The method of diversion must be consistent with 3R principles.

The funding for this component of the Tire Recycling Program is administered through the Waste Management Branch's Industrial Waste Diversion Program (IWDP). The criteria of the IWDP are essentially used to assess eligibility and funding levels of tire recycling projects.

Capital projects include proposals that establish production facilities that process scrap tires into raw materials for use in value-added products, or facilities that produce the value-added products from scrap tires.

The funding level for these types of projects can be as high as 50% of the eligible capital costs. This is determined on a case-by-case basis. All of the proposals for capital assistance must demonstrate that end markets are available for the raw materials or the products produced.

Projects that deal with converting scrap tires into energy, or into products to be used for energy, are not eligible for assistance through this program. These projects should be directed to the Ministry of Energy.

7.2 Research and Development of Technologies and Market Development:

The Ministry of the Environment will continue to provide financial assistance to the private sector for research and development of technologies that are necessary to produce the raw materials or value-added products. The Tire Recycling Program provides assistance for market development of products made from scrap tires. The work must clearly follow the 3R principles.

Projects that deal with applied research and development, and the demonstration of existing technologies and markets for tire applications, will be handled through the Industrial Waste Diversion Program. The funding level for these projects can be as high as 100% of the eligible costs of the project. This is determined on a case-by-case basis. Typically such projects have been a precursor of the capital projects that the Ministry has supported.

Projects that deal purely with researching and developing technologies or markets that are new to the tire industry are handled through the Ministry's Environmental Technology Fund, administered by the Research and Technology Branch.

7.3 Securing and Eliminating Stockpiles:

Many of the activities for this component of the Tire Recycling Program have been administered by the Operations Division of the Ministry and are described in Sections 6.1 and 6.2.

It has been noted that many existing sites are experiencing difficulties in complying with the provisions of the Fire Code and Certificates of Approval because of lack of funds, lack of recycling and disposal facilities accepting scrap tires, or lack of sufficient site area to allow pile separation or water storage to comply with the Fire Code.

7.4 Establishing a Collection and Sorting Infrastructure:

As part of the Ministry's short term strategy the Ministry will assist municipalities and the private sector to set up secure receiving facilities that meet the laws required for such sites.

The financial assistance will be towards the eligible capital costs associated with setting up the facility. The proposals must demonstrate the proponent's ability to separate tires for reuse and identify their outlets, separate tires for recycling and identify their outlets, and also store the remaining tires

in a manner that would make them acceptable for recycling projects in the future.

7.5 Underwriting the Use of Recycled Rubber in Asphalt:

The Ministry of the Environment recognizes that rubber modified asphalt has the potential of becoming a viable end market for crumb rubber in Ontario. In order to establish a reliable information base on this technology, the Ministry has undertaken two rubber asphalt demonstration projects. One of the projects is being coordinated with the Ontario Ministry of Transportation and the other project is being coordinated with the Regional Municipality of Haldimand-Norfolk. The purpose of the projects is to develop rubberized pavement mix designs, determine the performance of the modified asphalt, and monitor the air emissions of the asphalt plant during the processing of the rubber asphalt mix.

The Ministry of Transportation project will also examine the recyclability of the modified pavement by removing a portion of the pavement and recycling it into a reclaimed pavement mix. It will include hot in-place recycling and also reprocessing at the asphalt plant where monitoring of air emissions will take place. The work will begin in late spring of 1991 and be completed in early fall of 1991.

The Ministry of the Environment committed approximately $5.1 million towards the two projects. Both of the projects completed the placing of the rubber asphalt in the fall of 1990. Air emission tests and preliminary performance tests were completed. The results are expected to be available by the end of March. A long term monitoring program is a part of both projects.

If the monitoring program indicates that the performance of the rubber modified asphalt is equal to or better than conventional asphalt, a concerted effort from the provincial and municipal governments and the private sector is required to have this technology used. The following are some issues that need to be addressed.

* The incremental cost and how this will be supported.

* The availability of crumb rubber from Ontario, that will meet the specification required.

* The availability of the technology, and its proper application.

8.0 Summary

In the past, many scrap tires in Ontario were poorly managed. The benign nature of a tire made it convenient for scrap tire generators to landfill or stockpile them with little public concern. Due to the relatively low priority of scrap tires as a waste management issue, little effort was made by all levels of government, industry and the general public to implement sustainable waste management practices to deal with tires in an environmentally acceptable manner.

The implementation of the tire tax and the tire fire at the Tyre King site brought the issue of poor management to the attention of all the stakeholders. Scrap tire management must be consistent with public acceptance and the need for the 3Rs to play a lead role in managing wastes in Ontario.

The management of scrap tires is presently in a transition stage from a system that has been poorly managed to a system that is based on the 3Rs. In doing so, the system is experiencing growing pains in trying to move from a position where very few tires went to 3R options to a position were the majority are managed through the 3Rs. Viable end markets are presently growing, but are still very limited to absorb rubber from scrap tires. In addition, poorly managed parts of the existing infrastructure that have managed the tires in the past may be lost.

The Ministry of the Environment has identified and implemented a variety of initiatives that are required for this transition. The past problems of scrap tire management must be addressed through the remediation and securing of existing stockpiles, the introduction of regulations concerning the management of scrap tires, the enforcement of these regulations, the funding of projects that divert scrap tires from disposal and the funding of technology and market development that support the 3Rs.

This paper provides a background on the activities, efforts and future direction needed to fulfil long and short term strategies. Many of these activities have already taken place and are consistent with some of the strategies identified in the Scrap Tire Management in Ontario study. In order to implement activities that will meet the needs of all stakeholders, their involvement and support is required.

It is hoped that the workshop sets the foundation for government, industry, environmental groups and the general public to work in a cooperative effort to implement a scrap tire management system that is based the 3Rs.

MINISTRY OF THE ENVIRONMENT REGIONAL OFFICES

Office	Regional Jurisdiction
Central Region 7 Overlea Boulevard 4th Floor Toronto, Ontario M4H 1A8 (416) 424-3000	Metropolitan Toronto, Halton, Peel, York, Durham, Northumberland, Peterborough, Victoria, Simcoe, Muskoka, Haliburton
West-Central Region 119 King Street West 12th Floor P.O. Box 2112 Hamilton, Ontario L8N 3Z9 (416) 521-7640	Hamilton-Wentworth, Niagara Haldimand-Norfolk, Brant, Waterloo, Wellington, Dufferin
Southwestern Region 985 Adelaide Street S. London, Ontario N6E 1V3 (519) 661-2200	Oxford, Elgin, Essex, Lambton, Middlesex, Kent, Bruce, Grey, Huron, Perth
Southeastern Region P.O. Box 820 133 Dalton Street Kingston, Ontario K7L 4X6 (613) 549-4000	Hastings, Prince, Renfrew, Edward, Lennox & Addington, Frontenac, Lanark, Dundas, Leeds, Grenville, Prescott, Stormont, Glengarry, Russell, Ottawa-Carleton
Northeastern Region 199 Larch Street Regency Mall Sudbury, Ontario P3E 5P9 (705) 675-4501	Parry Sound, Sudbury, Algoma, Nipissing, Timiskaming, Cochrane
Northwestern Region P.O. Box 5000 435 James Street South Thunder Bay, Ontario K7L 4X6 (807) 475-1205	Thunder Bay, Rainy River, Kenora

APPENDIX D

PROCEEDINGS

FOR

SCRAP TIRE MANAGEMENT WORKSHOP

1. OPENING REMARKS:

Joyce McLean - Special Assistant, Policy Office of the Minister of the Environment

2. " THE CHALLENGE OF SCRAP TIRE MANAGEMENT IN ONTARIO":

Neal Ahlberg, Ministry of the Environment
Felix Pilorusso, Pilorusso Research Associates Inc.

3. TECHNOLOGY AND MARKETS: OPTIONS AND CONSTRAINTS:

Terry Gray, T.A.G. Resource Recovery
Tony Holland, CVL Products Ltd.
Rolf Huber, Sportbau Canada Limited
Carl Katz, National Rubber
Gary Mottershead, Recovery Technologies Inc.
Fred Svirklys, Domal Industries Inc.
Barry Takallou, BAS Engineering

4. THE FEASIBILITY OF IMPLEMENTATION: ACCOMPLISHMENT TO DATE IN 3R TIRE MANAGEMENT &HOW MUCH FURTHER WE CAN GO

Paul Hyatt, Tire Dealers Associaton of Canada
Roman Martiuk, The Regional Municipality of Waterloo
Peter Martyniuk, Canadian Auto Recyclers
David Morgan, Rubber Association of Canada
Ellen Schwartzel, Pollution Probe

OPENING REMARKS:

Presentation by: *Joyce McLean*, Policy Office of the Minister of the Environment

Good morning everyone.

On behalf of Ruth Grier, the Minister of the Environment, I would like to say I'm happy to be here to highlight some concerns and interests that she has about scrap tires.

Since the Hagersville tire fire, we continue to see public interest grow on the issue of what to do with our existing piles of tires and how to slow down the creation of the 7-8 million tires generated in this province every year. Programs to address these scrap tires were strengthened after the Hagersville fire and today the Ministry of the Environment not only has a clearer sense of the inventory of tires than it did one year ago, but the Ministry also has some reuse projects in place.

As a result of the tire tax, funds have been made available from Treasury to the MOE for demonstration projects that support the recycling and reuse of tires. Essentially, these projects fall into two areas:
-- roadbuilding projects. In other words breaking old tires down into rubber crumb for rubberized road asphalt demonstrations. Currently, two projects have been completed, are now under assessment and the early results seem very positive.
-- as well, the MOE has funded private sector proposals to produce consumer products such as floor mats and other rubberized goods that are made from used tires.

The Minister believes that tires are another form of solid waste that need to be viewed as a resource, rather than as garbage. Only through the use of reduction, reuse and recycling strategies can we hope to diminish the current tire piles.

I know many of you in the audience are interested in the use of tire-derived fuel. At this time, I would like to signal that the Minister is not in favour of this option. More specific meetings will be held shortly with

the Minister's staff and industry proponents of this technology to fully discuss this matter.

I would like to leave you with this thought. Because of enormous community regard and awareness for the environment, public policy is being driven to incorporate many principles unthought of a few years ago. For example, the notion of a zero discharge of persistent toxic substances is now being taken seriously as a public policy priority that only a few years would never have been considered.

Another of these is product stewardship. We know for instance, that the battery manufacturers in North America are exploring ways to reclaim their product before the disposal stage in order to save resources. The soft drink industry is using returnable bottles in order to refill with their product. In Germany, BMW is in the construction phase of a facility that will recycle whole cars.

Surely, the tire manufacturers should be taking more responsibility for their product once it's in the public domain -- making longer lasting tires and/or setting up retrieval mechanisms for the millions created every year is needed, in order for the industry to use less raw materials and the public to shoulder less of a burden for management once tires are discarded. I know the Minister wishes to leave this thought with the tire industry in order for you to develop longer term approaches and a more holistic sense of the resource and social issues involved.

May I wish you all a successful conference.

Thank you.

"THE CHALLENGE OF SCRAP TIRE MANAGEMENT IN ONTARIO"
Presentation by: *Neal Ahlberg*, Ministry of the Environment

THE CHALLENGE OF SCRAP TIRE MANAGEMENT IN ONTARIO

NEAL R. AHLBERG

ONTARIO MINISTRY OF THE ENVIRONMENT

March 6, 1991

WASTE DIVERSION

- 25% BY 1992

- 50% BY 2000

SCRAP TIRE GENERATION

- 6.8 MILLION PASSENGER
- 1.2 MILLION TRUCK

SCRAP TIRE MANAGEMENT

- INDUSTRIAL WASTE DIVERSION PROGRAM, JUNE 1987
- TIRE TAX, JUNE 1989
- OSTTF, NOVEMBER 1989
- STUDY, JANUARY 1990
- TIRE RECYCLING PROGRAM, MARCH 1990
- REGULATION 162/90, APRIL 1990
- REGULATION 281/90, JUNE 1990
- ENVIRONMENTAL PROTECTION STATUTE LAW AMENDMENT ACT, JUNE 1990

TIRE RECYCLING PROGRAM

- $16 MILLION 1990-91
- 3R PROJECTS
- COLLECTION, HANDLING & SORTING
- RESEARCH, MARKET DEVELOPMENT
- ELIMINATE STOCKPILES
- RUBBER ASPHALT

TIRE RECYCLING PROGRAM

- OVER FIFTY PROPOSALS
- NINE PROJECTS, OVER $20 MILLION
- TWO RUBBER ASPHALT PROJECTS (18 KM)

SCRAP TIRE
TECHNICAL OPTIONS

- 3Rs
- STOCKPILES
- EXPORT
- LANDFILL
- INCINERATION

SCRAP TIRE MANAGEMENT ISSUES

- TECHNOLOGIES
- MARKETS
- ECONOMICS
- CONTROLS
- ROLES
  - MUNICIPALITIES
  - PRIVATE SECTOR
  - PROVINCE
  - FEDERAL
  - PUBLIC

CHALLENGES

- LONG TERM

- SHORT TERM

- TRANSITION

- COOPERATION

" THE CHALLENGE OF SCRAP TIRE MANAGEMENT IN ONTARIO "

Presentation by: *Felix Pilorusso*, Pilorusso Resesarch Associates Inc.

SCRAP TIRE MANAGEMENT IN ONTARIO

OBJECTIVE: **Identify policy options that will promote the "Three R's"**

SCOPE OF THE STUDY

- Document current scrap tire management practices in Ontario
- Evaluate scrap tire processing technologies
- Describe scrap tire management programs in other jurisdictions
- Analysis of policies to promote the Three R's

STUDY METHODOLOGY

- Interviews with representatives of all groups of stakeholders
- Open literature

OUTPUTS OF THE STUDY

- Everything anyone might ever want to know about scrap tire management
- No policy recommendations

CURRENT FATE OF SCRAP TIRES

Recycled	< 10 %
Export	~ 5 %
Tire piles	~ 10 %
Landfill	60 - 80 %

THE CHALLENGE

- Lack of market demand for scrap-tire-derived materials
- Shortage of legal destinations for scrap tires
- Consumers are paying $5 tire tax (plus PST and GST) and a tire disposal fee of $1 to 2

RECYCLE INTO OTHER PRODUCTS

CRITERION	SHORT (5 YR) TERM	LONG (10 YR) TERM
THREE R'S	☺ ☺ ☺ ☺	☺ ☺ ☺ ☺
POTENTIAL FOR ADVERSE EFFECTS	☺ ☺ ☺ ☺	☺ ☺ ☺ ☺
TECHNICAL FEASIBILITY	☺	☺ ☺
FAVORABLE COSTS	☹	☺
ADEQUATE MARKETS	☹	☺ ☺

CIVIL ENGINEERING PROJECTS

CRITERION	SHORT (5 YR) TERM	LONG (10 YR) TERM
THREE R'S	☺ ☺ ☺	☺ ☺ ☺
POTENTIAL FOR ADVERSE EFFECTS	☺ ☺ ☺	☺ ☺ ☺
TECHNICAL FEASIBILITY	☺ ☺ ☺	☺ ☺ ☺
FAVORABLE COSTS	☹	☺ ☺
ADEQUATE MARKETS	☺ ☺	☺ ☺

RECOVERY OF RAW MATERIALS

CRITERION	SHORT (5 YR) TERM	LONG (10 YR) TERM
THREE R'S	☺ ☺	☺ ☺
POTENTIAL FOR ADVERSE EFFECTS	☺ ☺	☺ ☺ ☺
TECHNICAL FEASIBILITY	☹	☺
FAVORABLE COSTS	☹	☺
ADEQUATE MARKETS	☺	☺ ☺

TIRE DERIVED FUEL

CRITERION	SHORT (5 YR) TERM	LONG (10 YR) TERM
THREE R'S	☺	☺
POTENTIAL FOR ADVERSE EFFECTS	☺ ☺	☺ ☺ ☺
TECHNICAL FEASIBILITY	☺ ☺ ☺	☺ ☺ ☺ ☺
FAVORABLE COSTS	☺ ☺ ☺	☺ ☺ ☺ ☺
ADEQUATE MARKETS	☺ ☺ ☺	☺ ☺ ☺ ☺

SHRED AND LANDFILL

CRITERION	SHORT (5 YR) TERM	LONG (10 YR) TERM
THREE R'S	☹	☹
POTENTIAL FOR ADVERSE EFFECTS	☺ ☺ ☺	☺ ☺ ☺
TECHNICAL FEASIBILITY	☺ ☺ ☺	☺ ☺ ☺ ☺
FAVORABLE COSTS	☺ ☺ ☺	☺ ☺
ADEQUATE MARKETS	☺ ☺ ☺	☺ ☺

SHORT (5 YEARS) TERM

PORTION OF SCRAP TIRES RECYCLED: 20 - 30 %

OPTIONS FOR REMAINDER:

- **Store**
- **Incinerate**
- **Shred and landfill**

LONG (10 YEARS) TERM

PORTION OF SCRAP TIRES RECYCLED: 40 - 50 %

OPTIONS FOR REMAINDER:

- **Store**
- **Incinerate**
- **Shred and landfill**

EXHIBIT A-1

CHARACTERISTICS OF TIRE-DERIVED FUEL

CHARACTERISTIC	WHOLE TIRE	TDF (BEAD WIRE REMOVED)
Heat Value (kJ/kg)	13,500-14,500	14,800-15,500
Proximate Analysis (Wt %)		
Ash	15	5
Volatile Matter	60	67
Fixed Carbon	25	28
Total	100	100
Elemental Analysis (Wt %)		
Carbon	75.5	84.4
Hydrogen	6.3	7.1
Nitrogen	0.2	0.2
Sulphur	1.1	1.2
Oxygen (by difference)	1.9	2.1
Ash	15.0	5.0
Total	100.0	100.0

Exhibit B-1

Primary Chemical Reactions Of Portland Cement Production

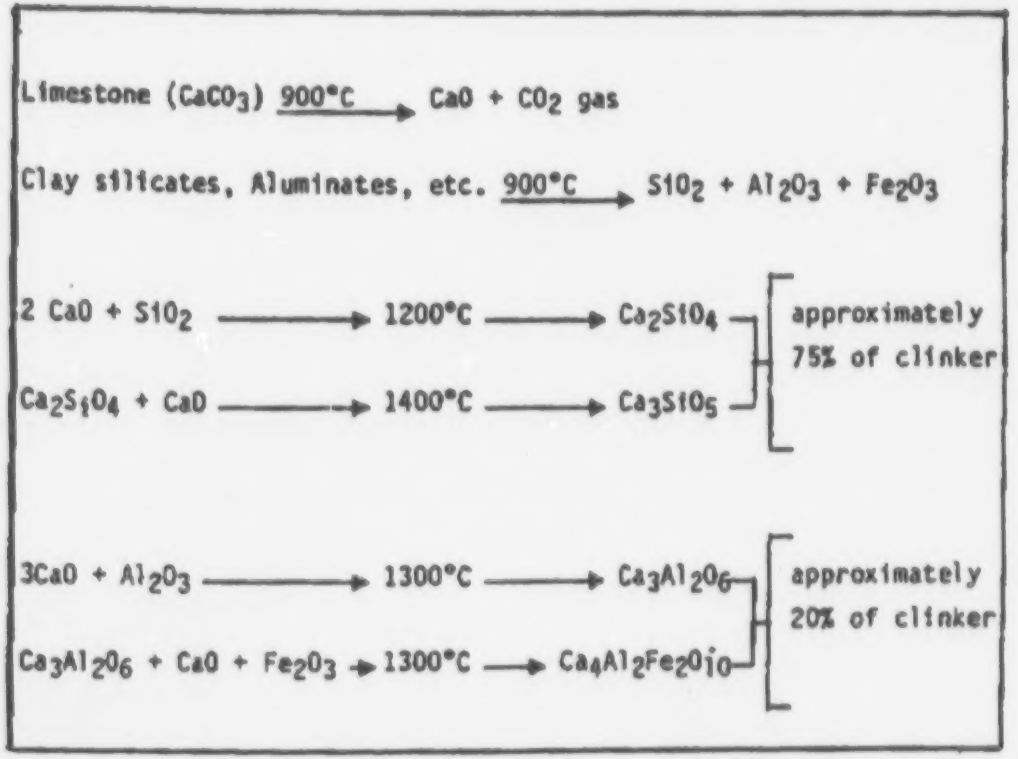

Limestone ($CaCO_3$) 900°C → CaO + CO_2 gas
Clay silicates, Aluminates, etc. 900°C → SiO_2 + Al_2O_3 + Fe_2O_3
2 CaO + SiO_2 → 1200°C → Ca_2SiO_4
Ca_2SiO_4 + CaO → 1400°C → Ca_3SiO_5
approximately 75% of clinker
3CaO + Al_2O_3 → 1300°C → $Ca_3Al_2O_6$
$Ca_3Al_2O_6$ + CaO + Fe_2O_3 → 1300°C → $Ca_4Al_2Fe_2O_{10}$
approximately 20% of clinker

Exhibit B-2

Schematic Clinker Manufacturing Process

THE KILN PORTION OF THE CEMENT MANUFACTURING PROCESS

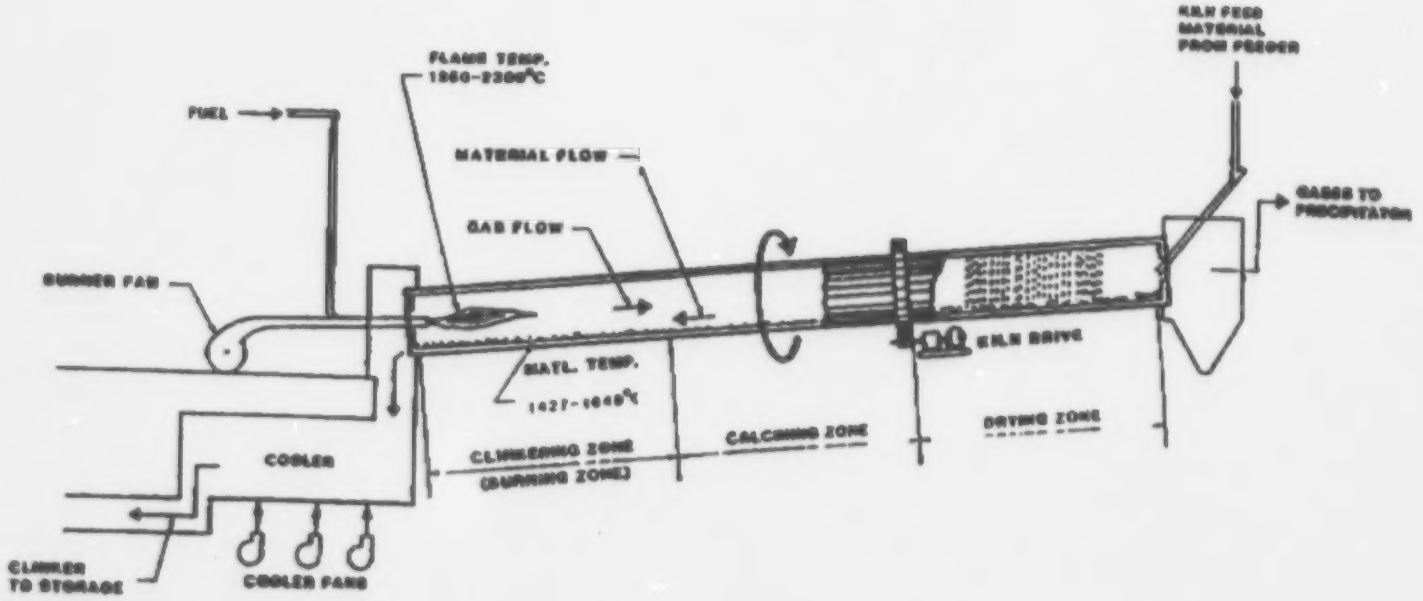
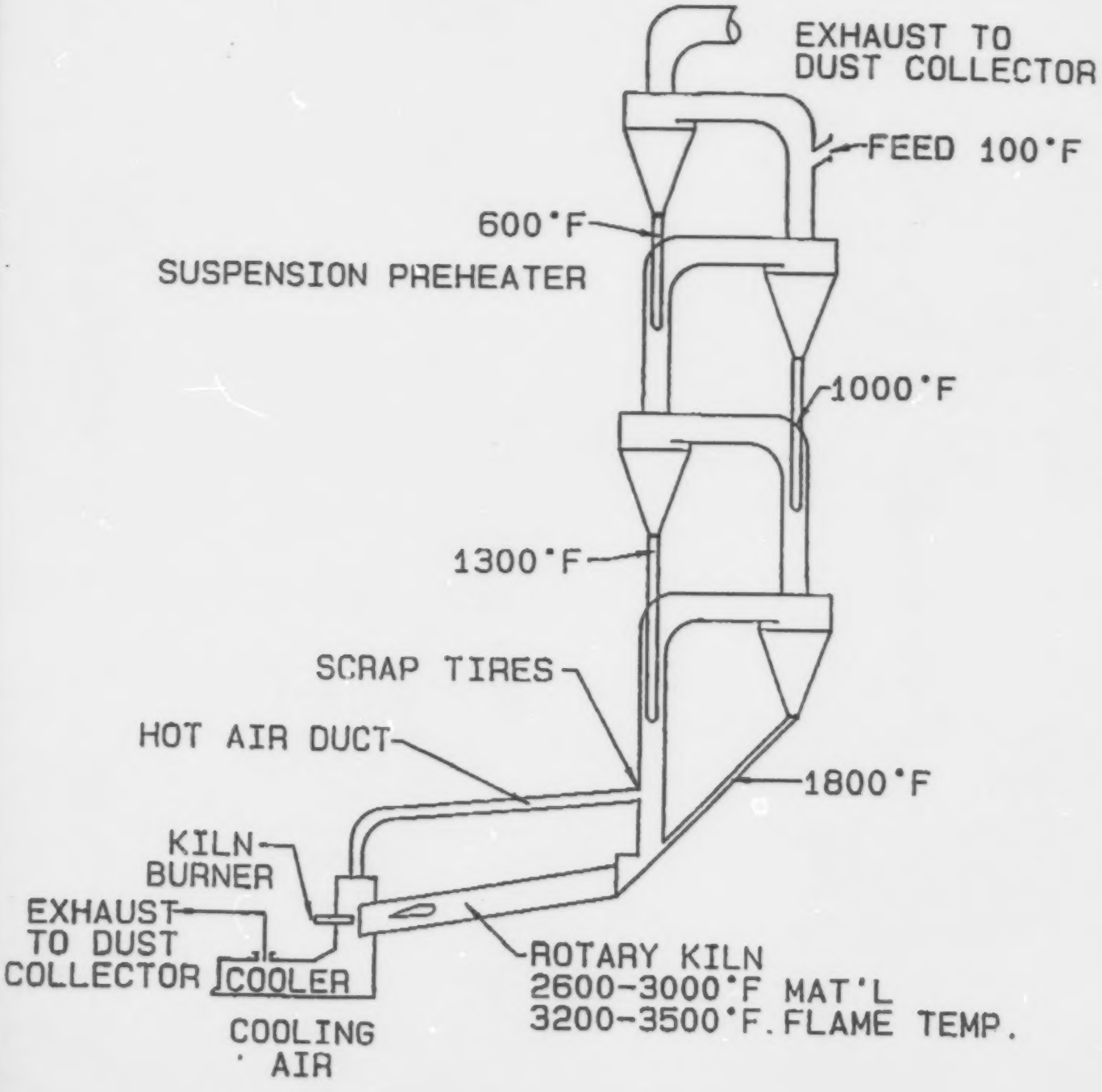


EXHIBIT B-3

SCHEMATIC PRECALCINER KILN CONFIGURATION

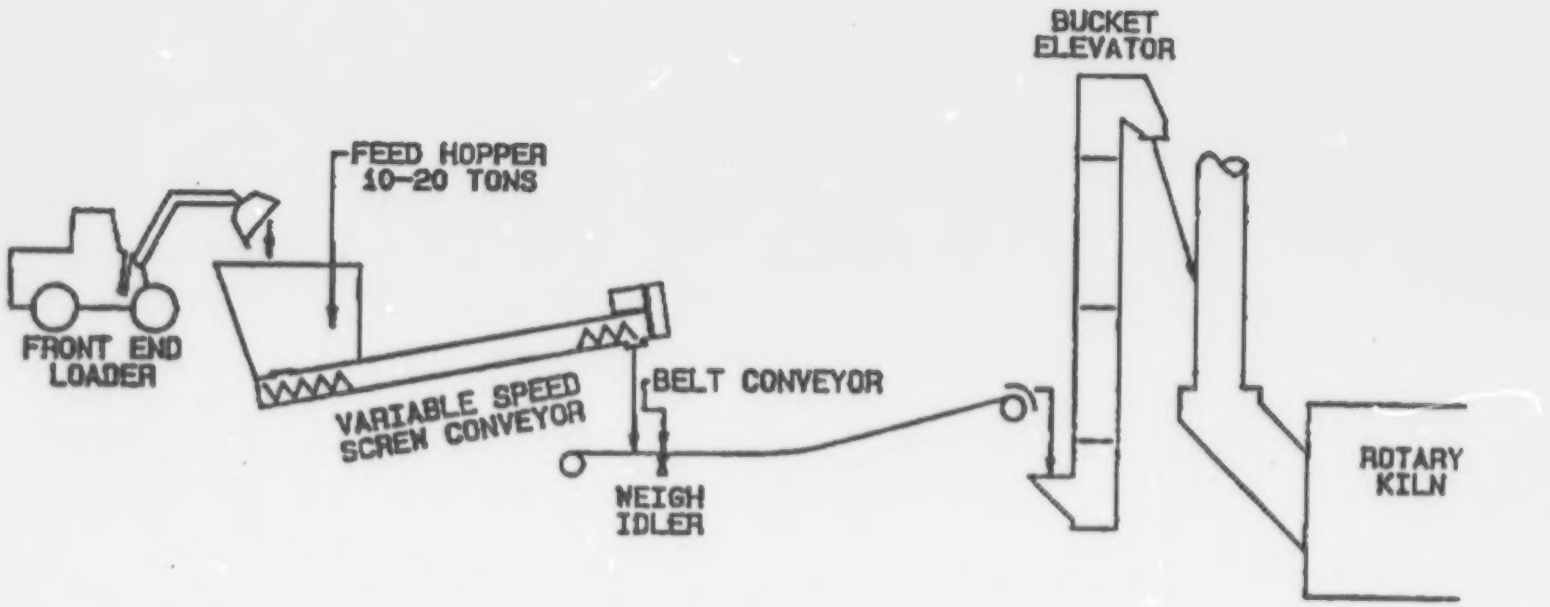


SOURCE: CEMENT MANUFACTURERS ASSOCIATION

Exhibit B-4

Schematic Flowsheet

Typical TDF Metering System For Cement Industry



Environment Performance Data
TDF Introduction Into Riser Section
of Preheater Kiln at Florida Crushed Stone

Criteria	Units	Baseline	14% TDE
Particulate	pounds/hour	56.80	52.21
S02 Emissions	pounds/hour	595.15	551.30
Volatile Organics	pounds/hour	.15	.44
Semi-Volatile	pounds/hour	5.01	0.90

Environment Performance Data
TDF Introduction Into Riser Section of Preheater Kiln at Florida Crushed Stone

Criteria	Avg Emission Rate (10 E-6 lb/hr)		Equiv 2378-Tetra Dioxin Emissions (10 E-6 lb/hr)	
	Coal	14%TDF	Coal	14% TDF
Dioxins	9.667	1.530	0.037	0.001
Furans	0.883	0.307	0.017	0.006
Total (10E-6 lb/hr)	10.550	1.837	0.054	0.007

EXHIBIT B-7

ENVIRONMENTAL PERFORMANCE DATA
TDF INTRODUCTION INTO RISER SECTION
OF PREHEATER KILN AT ASHGROVE CEMENT

CRITERIA	UNITS	BASELINE	9-10% TDF	PERMIT LIMIT
Particulate	lbs/hr	5.27	4.83	18.0
Sulfur dioxide	lbs/hr	<1.5	<1.2	6.3
Chlorides	lbs/hr	0.268	0.197	NA
Total hydrocarbons	lbs/hr	3.0	3.3	NA
Polynuclear aromatic hydrocarbons (PNA) Naphthalene, Dibenzofuran, Phenanthrene	lbs/hr	0.0058	0.0053	NA
Heavy metals	micrograms			
Arsenic		0.2	0.2	NA
Cadmium		3.0	2.0	NA
Chromium		30	ND	NA
Nickel		30	ND	NA
Zinc		35	35	NA
Copper		37	13	NA
Lead		ND	ND	NA
Iron		400	200	NA
Barium		ND	ND	NA
Vanadium		ND	ND	NA

EXHIBIT B-8

EMISSIONS FROM A PORTLAND CEMENT PRECALCINER KILN

BURNING NATURAL GAS AND TDF

KILN OPERATING DATA

Test Number	1	2
Date Tested	12/89	12/89
Kiln Fuel	Nat.Gas	Nat.Gas
Precalciner Fuel	Nat.Gas	Nat.Gas/TDF
Stack Flow Rate (dscfm)	133,363	133,743
Excess Oxygen (%)	11.4	11.1
Kiln Feed Rate (tons/hr)	96	96
Tire Feed Rate (tons/hr)	0	2.2

EMISSIONS DATA

Particulates		
grains/dscf	0.0035	0.0065
lbs/hr	3.93	7.4
lbs/ton of feed	0.041	0.077
Sulfur Dioxide		
ppm	3.1	7.1
lbs/hr	4.2	9.4
Nitrogen Oxides		
ppm	103	86
lbs/hr	98.5	82.3
Carbon Monoxide		
ppm	166	116
lbs/hr	95.2	68.4
Total Hydrocarbons		
ppm (as propane)	3	5
lbs/hr	2.7	4.6

Source: Portland Cement Association

EXHIBIT C-3

ENVIRONMENTAL TRIAL DATA

WET BOTTOM POWER BOILER

Emissions Levels (#/MM Btu)

Criteria	% Heat Replacement by TDF				
	0%	5%	10%	15%	20%
SOx	5.30	5.73	5.71	5.47	5.34
NOx	0.601	0.510	0.436	0.443	0.387
Particulate	0.0631	0.0717	0.0564	0.0815	0.0453
Lead	0.000096	0.000099	0.000096	0.000097	0.000091

01

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS

Presentation by: *Tony Holland*, CVL Products Ltd.

CVL Products Ltd., with a staff of 47, is a member of the Canadian rubber industry, located in Thorold, Ontario. Principally the company engages in the service of re-covering large steel rollers utilized in the steel making industry and the relining of tanks and specialty pumps used in a variety of industries where abrasion resistance is essential to the useful life and operation of these objects. Secondly, the company provides a custom compression moulding service for vulcanized rubber parts not suitable for injection moulded techniques. In addition, the company prepares and mixes "non-black" custom rubber compounds which are sold to customers for further processing into finished products, and manufactures calendered sheet rubber in unfinished or vulcanized form for the die-cut gasket industry. All of these operations share a common technological base, and are supported by a well equipped and professionally staffed technical and research facility. A direct result of activity in our R & D lab has led to a process whereby we have successfully combined scrap tire rubber together with scrap plastic, both post industrial and post consumer, to produce compounds which are compatable with existing fabrication technologies.

To give you a better appreciation of how we developed our process, some recent history might be appropriate. In our own operation we generate a significant amount of vulcanized rubber scrap on an annual basis. In addition, we purchase, use, and then discard various grades of poly based film. In an effort to come to grips with this waste problem we decided to do some casual exploration of these materials in our own research lab to determine if we combined these scrap materials would they compound, and if so what would be the physical properties. As might be expected the initial results were not startling, but were encouraging enough to dedicate some resources for further

development. Coincidental with this activity the tire fire at Hagersville, Ontario occurred. Our awareness of the magnitude of the tire problem was brought into focus and our efforts were directed more specifically to scrap tires. From that point, just over one year ago, we have, on an ongoing basis, created from various reclaimed polymer materials a variety of thermoplastic compounds which have significant commercial possibilities. We have to date generated 50 tons of material for sampling and research purposes and some finished products, which were made to assess the stability, compatibility and process ability as well as end product evaluation.

Over the last twenty-five years sensitivity and awareness has been growing in regard to the management of our environment. In the past developing economically viable solutions to specific pollution and waste problems was difficult, in that the solution was generally found to be more costly than the perceived negative effects of the problem. Scrap tires are one such problem. Until recently it had been relatively easy for the tire retailer to discard scrap tires as just another waste item, with landfill space being plentiful and the cost of disposal being quite low. Today landfill space is becoming scarce, and tipping fees are headed into the stratosphere. Some municipalities have banned, or are considering banning scrap tires as a landfill item. Indirectly governments of all levels have assisted in addressing the economics of waste management through the passage of legislated guidelines, to begin and continue the clean -up process. One major point, which has been the focus of many discussions is; "Who's problem is scrap tires?". In an information meeting we held last year a provincial government representative stated it was an tire industry problem. In turn a tire industry representative stated that it was a tire retailer's problem, who suggested that since they paid municipal taxes it was a municipal problem. The municipal representative said that they had no access to the taxes generated by scrap tires and felt

that the province had bought the problem. We believe the question is irrelevant and should be replaced by "There is a scrap tire problem, and what can all parties involved do to solve it!"

Unfortunately, scrap tires have recently become one of the major focus points for public and private sector attention. The rubber industry, although aware that rubber does create a bulk waste problem, has been unsuccessful in developing technology that would, cost effectively, address the problem. Vulcanized rubber, because of its physical properties, creates a significant litter problem until such time that it is burned, in an uncontrolled environment, when it does create a pollution problem. Controlled burning of rubber waste, for the co -generation of power, has been a suggested and practised disposal method elsewhere and could become one part of an acceptable problem solving solution. Rubberized asphalt is another potential piece of the solution puzzle that can be used. We are not advocates of either of these methods of disposing of scrap tires, but believe all avenues must be recognized and explored for their potential. Development of products for the consumer, industrial, automotive and construction markets presents another viable way of disposing of scrap tires. No single process or technological advance will, in itself, solve all of the problems, however as each piece of technology is developed they in aggregate will eventually solve the majority of the problem.

The plastics industry has had little more success in addressing the bulk waste generated by their users. Problems relating to separation by plastic type volume and delivery have slowed the development of new or substitution products being created to utilize recycled plastics.

Many separate companies have endeavoured and, in some cases, have claimed to have developed economically viable solutions to some or all of the scrap tire and plastic waste problem. Unfortunately, none of the solutions proposed to date have been able to justify their solution in economic terms

without significant governmental financial assistance. Our belief is that government can and will assist in projects to find solutions to waste problems, but they will not be the solution itself.
Much of the existing and future problems created in rubber and plastic waste are a direct result of innovations in polymer chemistry which have resulted in the near indestructibility of the compounds themselves. Additionally, high capital and operational costs relating to the reclaimation and reprocessing of scrap tires or plastics has held up the ongoing development process. Innovative solutions can and have been found to address this issue head on, some of which are being introduced at this meeting.

At CVL we believe the research that has been accomplished to date creates a dynamic approach to addressing the problem. We are not concerned with bulk waste reduction as there are many companies with the technology already developed, together with collection networks in place to address this part of the issue. We do directly address the aspect of creation of high value added products which have marketability together with margins that are commercially attractive. We believe that products developed from our compound should have a minimum service life expectancy of three years to delay the reintroduction of these materials into the waste stream.

We believe there are significant commercial possibilities to be derived utilizing our technology.

THE PRODUCT CYCLE

BULK WASTE REDUCTION

Bulk rubber waste is generated from a number of sources, some of which are used tires, industrial production waste, discarded consumer goods etc. To date, there has been various attempts to reconstitute the rubber reclaimed through various

grinding and chopping processes into products which can be reintroduced to the industrial and consumer markets. Some uses found for reclaimed rubber include using crumbed rubber as filler in asphalt paving, agricultural matting and as filler for carpet backing. The problems relating to the use of crumb in other products are product consistency, odour, and structural properties. The ongoing development of more cost effective ways to reduce bulk rubber waste, such as cryogenic or more advanced ambient grinding techniques, have begun to establish a base product quality which will lead to the development of diversified, higher value added products for industrial and consumer markets.

Complimenting the reclamation and bulk reduction of rubber is a similar process for bulk reduction of plastics. Due to problems relating to the separation of plastics by type, the development of downstream products has to be considered carefully. In some products, such as ditch or pond lining this is not such a major concern, but when consumer products are to be produced, consistency must be maintained to gain market acceptance.

COMPOUNDING

The basis for development of any and all marketable products created is the effective production of consistent compounds. These compounds, in as much as they are based on the use of recycled materials, must have physical properties that deliver consistent results, and be formulated to be compatible, stable and reproducable. To date much has been accomplished in this regard, however, continuation and customization of research must be done to determine exact physical properties of differing combinations of rubber crumb and thermoplastic groups to suit specific product requirements. Ultimately the consumer will determine the effectiveness of these new

compounds in products even if these products are marketed under a "green" or environmentaly friendly banner.

FABRICATION

Products fabricated out of recycled materials have been production tested in injection, blow moulding, rotational moulding, calendering, vacuum forming and extrusion. It is not a question of how to make products but what products can be made. Our materials have been designed to be integrated into the above fabrication techniques using existing equipment, however not every product available could or should be made out of recycled material. Factors including, material safety in processing, product integrety and safety in use must be considered carefully before any product is made commercially available.

MARKETING

Product quality and performance is the basis for market development of products utilizing reclaimed materials. The additional marketing "sizzle" is provided by the nature of the compound, in that, the product is made from recycled material, and is in its reconstituted form, is recyclable again. Problems associated with the perception of the material and by proxy anything made of the material exist. Recycled does not have to mean second grade or poor quality or any other connotation which detracts from the end use of the product itself. Developing demand for products is a process that requires time. If the consumer were more aware of the products available, made from recycled material, he might request them at his purchasing point. If the retailer were more aware that products can be fabricated out of recycled material he might demand them of his supplier. If the supplier/fabricator were aware that the

materials are available, that could be run in his existing equipment, he might demand these materials from his compounder. It would apprear that awareness at all levels is part of the problem. Costs associated with products made from recycled materials are, today, more expensive. In low volume situations very much so, and in high volume situations only small differences exist. Product volume and the amount of labour input into the fabrication of the material and of each product has a significant inpact on the final cost. Additionally, new marketing approaches and campaigns must be introduced. We anticipate that "green" marketing will grow from a novel approach to an expected approach in a very short period in time.

The problems associated with topic in discussion today are not about to go away. We believe anyone who is attempting to create solutions has a role to play in the problem solving process and suggest there are proactive roles for each participant to play, they being:

Governments: Willingness to support the process by:

Provision of Permits
Potential Site Identification
Purchase of Products
Providing Tires
Subscription to ongoing research

Industry: Willingness to support the process by:

Providing Tires

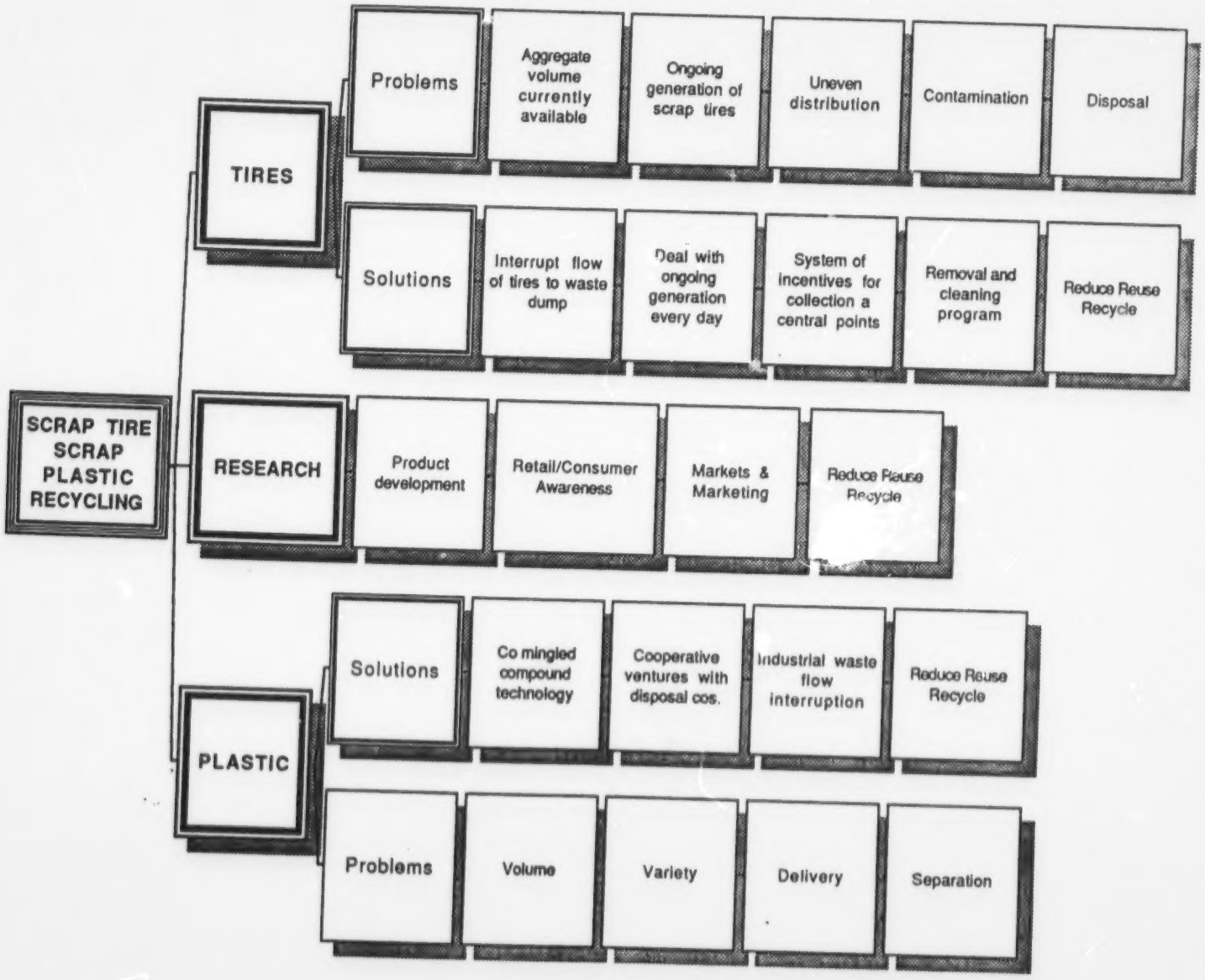
(5)

Identification of complimentary technologies
Purchase of Products
Subscription to ongoing research

Retail: Willingness to support process by:

Providing Tires
Distribution of Products

Again we would like to thank you for today's meeting and look forward to having discussions on this topic in the near future.


SCRAP TIRE SCRAP PLASTIC RECYCLING
TIRES
Problems
Aggregate volume currently available
Ongoing generation of scrap tires
Uneven distribution
Contamination
Disposal
Solutions
Interrupt flow of tires to waste dump
Deal with ongoing generation every day
System of incentives for collection a central points
Removal and cleaning program
Reduce Reuse Recycle
RESEARCH
Product development
Retail/Consumer Awareness
Markets & Marketing
Reduce Reuse Recycle
PLASTIC
Solutions
Co mingled compound technology
Cooperative ventures with disposal cos.
Industrial waste flow interruption
Reduce Reuse Recycle
Problems
Volume
Variety
Delivery
Separation

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS

Presentation by: *Rolf Huber*, Sportbau Canada Limited

Play and Recreation Environments as Alternate Tire Dumps

Existing and new recreation and play spaces can provide a major contribution to the recycling of waste tires.

The typical play and recreation surface utilizes polyurethane binders and rubber crumb of the 4 mesh to 10 mesh size. Depending upon the manufacturing and installation process, the amount of rubber crumb consumed will be 80 to 90% by weight of the total product. Depending upon the requirement of a play area as many as 1.5 tires per square foot installed will be recycled.

There are a number of ways to create a surface that utilizes polyurethane and rubber crumb. The first is the tradition system of producing a mat in a manufactured process. The investment for a machine capable of processing 285,000 tires per year would be in the area of $200,000. The alternative method is to mix the rubber granule at the site of the installation. A crew of 5 persons would be able to consume up 300,000 tires per year for a technology related capital investment of approximately $20,000.

What does this translate to in relation to an actual market? Are there enough playgrounds, recreation areas, running tracks and weight training rooms? Why should the owners of these facilities want or need to purchase surfaces with the properties of polyurethane bound rubber? What is the cost and where does the money come from for these installations?

To begin with an average Day Care Centre in a metropolitan area like Toronto will have a playground of 2,000 to 3,000 square feet. An elementary school will have a playground of 4,000 to 8,000 square feet and open paved play space that is well over 10,000 square feet. Secondary schools typically have a running track or 50,000 square feet and paved recreation areas of over 10,000 square feet. A playground that a municipal parks department would install would be a minimum of 3,000 square feet and a maximum of 8,000 square feet.

The Perly BJ Map Book for Metro Toronto and vicinity lists as many as 1,200 public and separate schools and over 140 secondary schools. The number of parks with playgrounds is not listed, but an assumption of 2 for every public or separate school would be a conservative estimate. Day Care Centres number in excess of 2,000 for the same area.

Taking the above information the surfacing potential would be:

School playgrounds	1,200	x 5,000	=	6,000,000 ft2
School paved areas	1,200	x 10,000	=	12,000,000 ft2
S. School tracks	140	x 50,000	=	7,000,000 ft2
S. School paved area	140	x 10,000	=	1,400,000 ft2
Municipal parks	2,400	x 5,000	=	12,000,000 ft2
Day Care	2,000	x 2,500	=	9,000,000 ft2
Total				47,400,000 ft2

To be realistic not all of these areas would require a surface consuming 1.5 tires per square foot, however 0.8 tires per square foot would be a realistic average. As a result the potential consumption would be 37,920,000 tires.

Since this is a large number of tires and would go a long way to resolution of the tire problem, consideration must be given as to reasons for the owners of these facilities to purchase a surface as described.

For running tracks and recreation areas there is no need or requirement to install surfaces that can be considered elite in their athletic characteristics. There is however a trend to upgrade the athletic and recreational facilities that are provided to meet the levels found elsewhere in the world. As a result the 20,400,000 square feet will require as much as 20 years to be surfaced.

The publication of the CSA standard for playgrounds in the autumn of 1990 stipulates that play surfaces should be tested in accordance with ASTM F355, which measures the impact forces generated on an object falling from the play equipment. The guideline of a maximum of 200 G's from a given fall height has been established by the Consumer Product Safety Commission in the United States and this has held up in a number of liability claims.

Traditional natural surfaces such as sand and pea gravel have been tested in accordance with ASTM F355. Results indicate that 9" of loose sand generates an excess of 200 G's at a fall height of 6'. When the sand is compressed and dry the height reduces to 4-5'. This testing of the traditional sand surface also does not consider the compaction that takes place in reality with rain and hundreds of children. Medium gravel at a 9" depth loose or compacted will allow for falls up to 10', however the major assumption here is that the gravel is not

disturbed and should it be disturbed that the maintenance manpower will be available to maintain the 9" depth.

As a result of the published information, the owners of playgrounds are exposed to significant costs in liability. Since the majority of the playgrounds are owned by schools or municipalities, this cost will be to the public.

The proper installation of a polyurethane bound surface can provide for a Gmax of less than 200 up to heights of 10' without significant maintenance.

The average cost of a polyurethane bound surface would be approximately $10.00 per square foot or $12.50 per tire.

How is the installation of these surfaces to be financed?

At this stage we must consider the monies that are being collected during the generation of waste tires and other funding options that are available.

The first obvious source of funds is the $5.00 tire tax that was established to offset the cost of recycling tires. Although the Ministry of the Environment currently places emphasis for grants on captial projects and research and development, it must be considered that the installation of these surfaces is not capital intensive and the technology exists and does not require reaearch and development. This existing solution, and its potential for making a significant reduction in the waste tires in the short and medium term should not penalize it from available funding.

The second is the drop-off or tip fee that tire retailers are charging to leave your old tire when new ones are purchased. These range from $2.00 to $3.50 and as places to dispose of tires are reduced this fee will increase. This fee goes toward the transport of the tire, transfer and dumping or destruction of the tire to crumb.

The crumb is currently a positive cost to the production of products using waste tires. This may well change as the above tip fee increases and dump sites diminish, the cost of maintaining a dump site increases and vigilance of illegal dumping increases.

At the time the Ontario Lottery Corporation was established it was to support the cost of the construction of cultural and recreation projects. This has been expanded, however the

surfaces as described do qualify under the Wintario Grant programs.

Taking these programs and fees into consideration the reduction in cost of the installation of a polyurethane bound rubber surface that started at $12.50 per tire would breakdown as follows:

Tire conversion cost	$12.50
Tire tax	$ 3.00
Free rubber crumb	$ 1.00
Wintario grants	$ 2.00
Balance to consumer of the product	$ 6.50

As a result the cost of the surface to the consumer would be $5.20 per square foot. This is an affordable cost and would be far less than the maintenance costs of traditional surfaces that will in most playgrounds not meet the liability exposure.

Now for the hard part.

What organization or government body is going to allow the contractor or private enterprise to receive the above grants from either the tire tax or Wintario. The first vision we all have is that of contractors basking in the sun consuming huge subsidies. In addition there is no assurance that the waste tires that are being consumed were actually generated in Ontario.

There is a solution!

A system should be established where the consumer of the surface makes application for grants under both the tire tax and the Wintario system. Money is only transferred to the purchaser once the installation has been completed and the purchaser is able to provide a certificate that states the quantity of rubber crumb and therefore passenger equivalent tires that have been consumed. The grant payment would be based in this certificate on a per passenger equivalent tire basis.

Contractors wishing to have clients participate in this system must apply for a license and be subject to audits that will confirm the amount of rubber used and the source of the crumb. There may also be a need to license the sellers of crumb to confirm that the crumb is actually from Ontario tires.

The utilization of play and recreation areas will provide alternate dump sites for approximately 38,000,000 tires and at the same time reduce the exposure to liability of public and private bodies. In addition this application would create approximately 633 man years of labour for the installations. This does not take into consideration the jobs created for the crushing of all of these tires.

The installation of the above surfaces to the extent that they will have a significant impact on the waste tire problem will not take place without significant effort on the part of the Ontario Government. The first will be the making of the funding available and putting a system in place that will allow for the implementation of the program. It will also require the training of personnel to provide the proper installation of surfaces and the establishing of tire crushing facilities that can provide the crumb in a quality that is required.

There is no doubt that there is work and effort to be expended to resolve the waste tire problem. The funding is in place, the technology is available and the public is rapidly becoming aware of the problem that polyurethane bound surfacing can solve. All that is required is a co-ordinated effort and alternate dump sites will be found in every community.

The alternative to making the effort is to let the problem continue to grow until the costs are so high that they are also not manageable. There will also be a point at which the effort that is being made in the private sector to generate and finance ideas for the consumption of tires will cease as a result of frustration and the problem and its solution will be have to be generated by the public sector.

Presented by Rolf Huber, President of Sportbau Canada Limited and EVERPLAY a division of 871322 Ontario Limited, Mississauga, Ontario.

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS

Presentation by: *Carl Katz*, National Rubber

National Rubber

I'd like to thank you all, in particular the Ministry, for the opportunity to address you today. The issue of scrap tire management is important to us all, both in Ontario and around the world.

National Rubber, for those of you who are not familiar with us, has been in business for over 60 years. Contrary to the opening remarks, tire recycling is not unknown to us. We are the major recycler of tire derived waste materials in North America using materials from all over the world. We employ just under 500 people in the Province of Ontario and use recycled materials in a wide variety of high value automotive and industrial products. Our products which are far more than floormats are distributed throughout North America and are used in the construction, transportation and automotive aftermarket segments. They include products such as sheet stock for diecutting, truck bed liners, wheel chocks, loading dock bumpers and truck splashguards. National is currently capable of using the equivalent of 3 million tires or 40% of Ontario's generation in our products today. These are not future products. These are products in use and being sold today.

As we deal with the issue of scrap tire management, I feel that it is important to state that we strongly believe, as stated in Ministry's scrap tire management report, that the best long term solution is the development of products that use scrap tires. We must also remember that in doing so businesses must be able to make a profit in order to sustain this activity. Recycling scrap tires into products provides a number of advantages to society. Obviously it helps to sustain employment and reduce the requirements for landfill and/or disposal activities. But the most important long term advantage is the conservation of the natural resources used for the production of petroleum based rubber products. In supporting the recycling options, the province must consider the fact that we are not only talking about converting a pile of tires into a pile of crumb rubber. For the option to work, there are significant support resources required by the companies if you expect them to survive and prosper in the business environment. We're not talking about just grinding rubber. The companies that produce products require a significant manufacturing base, and infrastructure for technical support and testing, customer acceptance that's built up over time and a

quality reputation. All of this is necessary to be successful in the marketplace. We at National have built that up over many years and it is somewhat naive to believe that you can get into the business and be successful overnight.

National Rubber

We must remember that to have a solution that will last and sustain itself, all parties involved in the execution must be able to make a profit. In addition, the Province of Ontario cannot operate in a vacuum. Its waste management policy must allow industry to be competitive with other global businesses. The risks and rewards of these activities must be recognized with the government and politicians accepting some of the risk. You cannot expect businesses to fund uneconomic programs. The tire tax provides resources to allow the government to subsidize recycled tire material to replace virgin plastics or rubber polymers.

Another important point to remember is that there is no tire grinder in Ontario today that is operating both profitably and consistently and therefore there is no one in a position to support companies such as us. This causes National to continue to source materials from the United States. The programs supported by the government must be both technically and economically viable to enable third party investment. The government can then be confident that the money will be used to solve the problem that they are trying to resolve.

There is no doubt that the ultimate solution to the scrap tire problem will come from a number of smaller solutions. National Rubber is a hundred per cent behind the political objective of eliminating the scrap tire problem and is eager to assist in any way that it can. I think that it is imperative that we do not lose the business perspective on this activity, and that we continue to strive to recycle this valuable resource in the most constructive manner.

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS

Presentation by: *Gary Mottershead*, Recovery Technologies Inc.

TIRE RECYCLING WORKSHOP

MARCH 6, 1991

RECOVERY TECHNOLOGIES INC.

TECHNOLOGY AND MARKETS:

OPTIONS & CONSTRAINTS

RECOVERY TECHNOLOGIES INC.

- ACQUIRED RETICO RUBBER ASSETS NOVEMBER/89
- RECEIVED M.O.E. C of A MAY/90
- SATISFIED ALL M.O.E. & FIRE MARSHALL CONDITIONS NOV 28/90
- PROCESSED 175 000 TIRES SINCE JUNE/90
- AYR FACILITY IS THE PROTOTYPE FOR TECHNOLOGY DEVELOPMENT AND PRODUCTION
- PLANT CAPACITY 1.0 MILLION TIRES/YEAR
- SITE TIRE STORAGE: 20 000 MAXIMUM
- SINCE START UP, SIGNIFICANT INVESTMENT HAS BEEN MADE IN CRYOGENIC PROCESS R & D

RUBBER GRINDING TECHNOLOGY

TWO BASIC TYPES:

AMBIENT
CRYOGENIC

- AMBIENT

  MILLING: TWO ROLL MILL(TEARING ACTION)

  BUFFING: TIRE RETREADING OPERATION

  GRANULATION: CUTTING OR CHOPPING ACTION

- CRYOGENIC

  USE LIQUID NITROGEN OR CARBON DIOXIDE TO FREEZE RUBBER PRIOR TO GRANULATION

ADVANTAGES

- AMBIENT: WIDELY AVAILABLE
  HIGH SURFACE TO WEIGHT RATIO:
  GOOD FOR MECHANICAL BONDING (ASPHALT)

- CRYOGENIC: DIAMOND SHAPED PARTICLE
  EXCELLENT FOR CHEMICAL BONDING
  (MOULDING)

  EFFECTIVE SEPARATION OF STEEL AND FIBRE

MARKETS

OPTIONS AND CONSTRAINTS

- TODAY NORTH AMERICA IS AWASH IN RECYCLED RUBBER
- WIDE AVAILABILITY FROM ALL SOURCES
- LOW DEMAND DUE TO:
  - RECESSION
  - WAR IN GULF
  - SEASONALITY OF DEMAND
- 4 MONTHS FROM NOW RUBBER GRANULES MAY BE IN SHORT SUPPLY
- RECYCLED RUBBER GRANULES ARE A COMMODITY PRODUCT, TRADED ON A WORLD WIDE BASIS
- PRODUCER WITH LOWEST COSTS WILL ALWAYS SURVIVE
- THE SUCCESSFUL RUBBER GRINDERS ALSO PRODUCE THEIR OWN PRODUCT
- THERE IS NO MARKET INFRASTRUCTURE IN PLACE IN NORTH AMERICA TO IMMEDIATELY CONSUME LARGE QUANTITIES OF RUBBER GRANULES FROM TIRES

MARKET STATISTICS

CANADIAN IMPORTS

WASTE, SCRAP, POWDER/GRANULES OBTAINED THEREFROM

	88	89	90*
10^6 LBS	32.1	37.5	32.1
$/lb	0.28	0.16	0.18

Note* Year to date: November

US MARKET

RUBBER IN ASPHALT

1977: 28.8 MILLION LBS

1986: 50.4 MILLION LBS

RUBBER TRADE BALANCE

	$,000'S YTD NOVEMBER	
WASTE - SCRAP POWDER/GRANULES	1989	1990
EXPORTS	13 226	20 083
IMPORTS	9 774	6 438

RECOVERY TECHNOLOGIES SITUATION

NEW PRODUCER

UNCERTAIN QUALITY

PERCEIVED HIGH COST

DIFFERENT PRODUCT: PARTICLE CONFIGURATION
WHITE SPECS

FIRST YEAR PRIMARILY R & D INTO PROCESS AND RUBBER MARKETS

BOTH CRYOGENIC PROCESS AND PRODUCTS/MARKETS REQUIRE ONGOING R & D TO SUSTAIN ECONOMIC VIABILITY

MARKET OPTIONS

ASPHALT: PRIMARILY RESEARCHED FOR AMBIENT GROUND RUBBER

POTENTIAL EXISTS TO USE FINE RUBBER PARTICLES IN ASPHALT BINDER SYSTEM

SPORT SURFACES: CRYOGENIC RUBBER IS THE PREFERRED CHOICE DUE TO REDUCED LEVELS OF BINDER

MISSED 1990 SEASON DUE TO TIMING OF START UP

MOULDED PRODUCTS: USED AS A "FILLER" OR VIRGIN RUBBER SUBSTITUTE FOR UP TO 25% OF COMPOUND

MASTICATED RUBBER: OFF SPEC OR WASTE VIRGIN RUBBER WITH UP TO 65% RECYCLED RUBBER FOR ANIMAL MATTING AND LOW END RUBBER PRODUCTS

RUBBER/PLASTIC BLENDS: A SIGNIFICANT OPPORTUNITY EXISTS FOR THE "RIGHT" PRODUCTS PRICED COMPETITIVELY TO REPLACE NEW PLASTIC MATERIALS

PYROLYSIS: POTENTIAL FOR RUBBER GRANULES
KEY IS QUALITY OF CARBON BLACK

FUEL: ONTARIO HYDRO IS PLANNING A TEST BURN AT KIPLING FOR LATER THIS YEAR, INTERESTED IN 1/2" - 1/4" NO STEEL

KEY CRITERIA FOR FUTURE SUCCESS

UNDERSTANDING

CO-OPERATION

INCENTIVE

UNDERSTANDING

KNOW THE DIFFICULTIES AND OPPORTUNITIES OF EACH STAKE HOLDER

HOW CAN WE HELP EACH OTHER:

GOVERNMENT - REGULATORY
- FINANCIAL

INDUSTRY - PRODUCERS

DISTRIBUTORS

CONSUMER - INDUSTRIAL
COMMERCIAL
RETAIL

CO-OPERATION

ONE COMPANY CANNOT GO IT ALONE

INVOLVED WITH: TIRE COLLECTION
M.O.E.
FEDERAL GOVERNMENT
OTHER PRODUCERS: CANADA/USA/EUROPE
MANUFACTURERS
DISTRIBUTORS

WE MUST ALL WORK TOGETHER PURSUING OUR OWN INTERESTS COOPERATIVELY

HOW TO DO THIS WILL COME FROM UNDERSTANDING EACH OTHERS NEEDS

REVIVE ONTARIO RUBBER RECYCLING ASSOCIATION

INCENTIVE

- CURRENT M.O.E. PROGRAMS HAVE HELPED KICK-START THE RECYCLING PROCESS

- THESE SAME PROGRAMS MAY INHIBIT NEW PROJECTS FROM STARTING

- PROVINCE NEEDS TO ENCOURAGE SALES OF PRODUCTS CONTAINING RECYCLED RUBBER AND TO RAISE PUBLIC AWARENESS OF THE PART THEY CAN PLAY

- RECOMMEND THAT A NEW PROGRAM TO ENCOURAGE SALES OF RECYCLED RUBBER PRODUCTS BE IMPLEMENTED

- RESULT: CONSUMER PAYS LOWER PRICE MANUFACTURES & DISTRIBUTOR MARGINS REMAIN INTACT

- GOVERNMENT DOES NOT HAVE TO DECIDE ON MERITS OF A SPECIFIC PROGRAM OR COMPANY

- MARKET FORCES WILL REGULATE PRICING AND ACCEPTABILITY

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS

Presentation by: *Fred Svirklys*, Domal Industries Inc.

ONTARIO MINISTRY OF THE ENVIRONMENT

TIRE RECYCLING WORKSHOP

March 6-7. 1991

TECHNOLOGY AND MARKETS

OPTIONS & CONSTRAINTS

Presented by:

FRED SVIRKLYS
President

DOMAL IND. INC.

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MOE SCRAP TIRE WORKSHOP MARCH 1991

TECHNOLOGY AND MARKETS: OPTIONS & CONSTRAINTS.

Distinguished Guests, Ladies and Gentlemen.

To begin with I would like to thank the organizers of this Workshop for inviting me to express my views on this important and timely subject.

I hope that my presentation will contribute to a better understanding of the complex problems we are confronted with and my attempt to introduce some new ideas.

The name of my Company is Domal Ind.Inc.it is an engineering organization. with specific objectives in the field of waste reduction, waste recovery, recycling and energy conservation.From Soil decontamination to tire recycling.

Domals experience has been gained as the result of more than 25 Years direct involvement in Material HANDLING, ALUMINUM Fabrication.Surface finishing ,Marine structures, Aquaculture, Plastics and Microwave Technology.

I should perhaps begin my presentation with the reference to the innovative use of Microwave Technology and our accomplishment in successful application of this technology, because it is directly related to the tire recycling process which I will address in my presentation

About 5 Years ago my Co. in collaboration with Ortech we developed a successful method of expending EPS in enclosed plastic cavities with the help of Microwave Technology.

The savings with our MICROWAVE PROCESS where quite remarkable we reduced our foam filling cost by 50% and produced a superior product.

But this was only a tip of the iceberg for a wide spectrum of Microwave applications related to waste recovery, recycling and decontamination.
This Technology was actually the contributing factor in our involvement in the tire recycling program.

But before I continue to elaborate further regarding Tires I would like to address the overall concept and meaning of waste, because to conserve and convert waste into valuable commodity, one must have good understanding how and why waste is generated.

There have been more than one occasion where due to lack of understanding, the attempts to recycle waste, in reality created more waste .

There are two kinds of waste. One you can see,touch and notice by its odor.
The other one , attracts little attention but is just as critical and deserves just as much consideration . This is energy waste.

One is related to the other. Both are the source of majority of our environmental problems and both must be addressed.

We are enormous waste generating society, with a total disregard for energy consumption or conservation. We take it for granted with complete lack of consideration for future generation .

The answer is obvious, we will have to pay a price.

Longer we wait, costlier its going to be.

Waste and Pollution are integrated.

One of classic examples is eastern Europe to day.

If we look back in history, our Forefathers had a much better concept of conservation and waste recycling, not by foresight but of sheer necessity.
For example the old traditional farming method, not a thing was wasted, what we took, we gave back, we had a ecological balance.

Perhaps this is over simplification, but I hope you are getting my point.

Industrial revolution, population explosion, constant demand for better and easier living standards, more comfort, lead to todays consumerism.

We succeeded in providing all the wonderful products and created life styles beyond the wildest dreams of our Forefathers but we failed in maintaining an ecological balance.

Well what this has to do with tires ?

In order to eliminate a problem one must understand the origin of the problem.

Because of an unfortunate incident of our own neglect and lack of understanding ,used tires became suddenly a very vocal topic,

MOE SCRAP TIRE WORKSHOP MARCH 1991

Recently I heard a catchy slogan " Trash for Cash " also it has some truth in it , it is very misleading and a fertile ground for bizarre, unrealistic ideas. It reflects a mentality which we must avoid .

To find a realistic solution for solving the tire problem, is not easy, it is associated with a lot of hard work, time and money, and it must be based economic business principals

In my personal opinion the only successful solution to eliminate waste in general is finding a practical reuse where it becomes a commodity which represents Value, that is money and profits.

Used tires do have valuable commodity RUBBER.

Incineration, Landfill sites are temporary measures.

In reality they are a "short term gain for long term pain" and not a solution.

How then one converts the rubber from tires successfully and economically into a marketable product ?

This is our challenge,

First we must establish what kind of technology is available to us.

Second by choosing the right technology we must also determined our true recycling costs.

Third we must identify potential markets

Fourth we must relate our findings to potential product selection and cost analyses.

Fifth we must select appropriate marketing strategy

Tire shredding has been around for a number of years. It is a known technology, accept it is , at the present time,to costly,in relation to the existing markets.

But this will change as process and product technology develops.

It is entirely possible that in not to distant future rubber crumb will become a valuable commodity and not just low cost filler.
Something to look forward to, by any shredder operator.

Cryogenic system perhaps most widely used, is relatively expensive and I don't see any significant breakthrough in cost reduction for some time to come.

Ambient process is less costly, but has its limitations. I do believe however that significant improvements will be achieved in foreseeable future.,

As the result, the relative high cost of shredding combined with a lack of innovative process and product technology is severely limiting the present marketability of rubber crumb

Therefor to achieve a reasonable return on investment and profitability in a shredding operation one must aggressively pursue process and product development.

Domal Ind. has recognized that a successful recycling of used tires can only be accomplished if and when shredding operations, as well as product manufacturers are able to generate a reasonable return on investment.

The shredder and product manufacturer are depending on each other or preferably they should be one integrated operation.

So far various attempts have been made to establish markets for rubber crumb, aside from traditional users, very few new applications are successful and those who are, are devoted towards specialty niche markets and products where rubber crumb is not only a filler but is utilized because of specific characteristics of rubber.

I believe this is a very interesting and significant point and reinforces my earlier comment that if waste can be transformed into a commodity the recycling process will be successful.

Domals strategy is based on the following analyses:

1.Specialty niche markets traditionally allow better than average price structure.

2. Innovative process and product design are of definite advantage to secure those markets.

3. Emphasis must be placed on rubber crumb positive material characteristic. Not just as a filler

4. Larger products offer superior marketing opportunities, greater price advantage and better profit margins as well as substantial consumption of tires per unit.

5. One word of caution, just because the product is made out of used rubber tires, does not mean automatic acceptance in the market place, it must bee accepted on its own merits and at competitive price.
Also Recycled used tires content is definitely an advantageous marketing tool.

Based on the above approach Domal Developed several products after comprehensive market study.

a. Floating dock structure systems for marinas, floating equipment and building barges, aquaculture flotation,,dredge pontoon lines, etc.

b. Floating breakwaters for marinas and harbor protection.

c. Interlocking retaining walls for water erosion protection.

All the above products are in a specialty niche market category.

In all instances, Characteristics of rubber are of definite material and product application advantage,

Existing price structure is sufficient to command a competitive price with attractive profit margins.

The weight per product ranges from 20Kg. to 250 Kg.

The combined North American market for marine application as described above exceeds $ 600 Million annually.

The realistic potential sales for the above value added products made out of rubber crumb , could be as high as $ 60 Million annually, or consumption of approximate 5 Million tires.

To be able to supply those markets, we must take in consideration the unique infrastructure or lack of it as far used tires are concerned.

In addition logistics, regulatory requirements,and proximity to the markets would require several manufacturing locations to service those markets.

Regarding process technology necessary to convert rubber crumb into acceptable products, there are a number of processes available.

We should distinguish two primary approaches.

One which is using rubber crumb as a filler

The other, where rubber crumb is the main component

I shall address the later.

1.The traditional process which is being used by several successful product manufacturers requires high temperatures in the range of 430 deg. F and good quality rubber crumb or preferably rubber shavings or buffings . No Binders

This process consumes considerable amount of energy, The heat loss is extensive.
The energy to heat conversion efficiency is less then 20% at best.

It has considerable emission and environmental drawback .

This process is confined mostly to compression molding applications

It is expensive.

The end product is of good quality, various compression strength can be achieved.

However in molding large objects there are difficulties in maintaining proper curing .

Domals experience in the field of Microwave Technology in cooperation with Ortech International have been instrumental in developing an innovative process to cure rubber crumb for compression molding applications.

The fundamental difference being that it uses dielectric heat to cure the rubber crumb mixture composed of 80% to 90% rubber crumb and 20% to 10% of thermoplastic binder.

Microwave technology application in this process offers several unique advantages and considerable cost savings.

1. The heat is generated almost instantaneous

2. There is no preheating time required

3. There is nominal heat loss

4. Energy conversion to heat has better then 50% efficiency

5. The process is extremely fast and can operate at temperatures as low as 175 deg. C.

6. It operates in continuous or batch system.

7. As the heat is generated within the material a uniform curing is possible in considerably large objects.

8. The equipment is very compact as it does not require substantial heating ovens. this represents about 60% space saving in comparison to conventional methods

9.It is environmentally friendly with minimum emissions, no health hazards or elaborate safety requirements.

10 The process is cost effective.

11. The end product can be fully recycled.

12. Various densities can be produced.

13. Has skin and foam forming capability.

This process offers many exiting possibilities and is not limited to compression molding only.

Domal is presently constructing a pilot plant operation to have the capability to demonstrate the process and produce prototype products as well as continue further development of applications for rubber crumb.

Before I conclude my presentation I would like to demonstrate the advantages of Microwave Technology in general, as a substantial energy saving source of heat.

My intention is to stress the importance and understanding of industrial application of Microwave Technology in relation to energy efficiency and conservation.

For instance:

Energy needs to cure 1Kg. rubber

Gas heating.....3000 Btu/lb.....7. Millijuoles/Kg.

Microwave heating..... 600 Btu/lb.....1.4 Millijuoles/Kg.

This is 80% reduction in energy cost

A comparison of more conventional nature to bake a potato (Consumer Reports magazine .89)

	Time	Energy	Cost
Microwave oven.....	12 min.	0.27 kwh.	$0.02
Electric convection oven...	67 min.	0.94 kwh.	$0.07

Microwave Oven took 18% of Time and 29% of energy of the electric convection oven to achieve same results.

In addition Microwave heating is environmentally clean, no emissions or heat loss, and 50%to 60% less space requirements.

To summarize my presentation:

Before reaching any business decision to secure a market for rubber crumb, I would like to stress the importance of careful planing,

The fundamentals are:

Realistic market analyses. Product design. Process selection, comprehensive cost study, testing, market strategy.

The bottom line is a profitable operation, based on the merit of your product, your marketing and business skills,

Such are the prerequisites to a successful solution of the tire waste problem

I would strongly suggest, before you undertake any business decisions ,seek the advise and help of professional consultants it will save you money, time and eliminate costly mistakes.

Domal will be more than pleased to provide those services and share our experience with you.

Thank you !

TECHNOLOGY & MARKETS: OPTIONS & CONSTRAINTS
Presentation by: *Barry Takallou* , BAS Engineering

RECYCLING OF WASTE TIRES IN ASPHALT PAVING MIXTURES

by

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for

Ontario Ministry of the Environment
Tire Recycling Workshop

March 5, 1991

Recycling of Waste Tires In Asphalt Paving Mixtures

by

Barry Takallou, Ph.D., P.E.

The use of ground tire rubber as an additive in various types of asphalt pavement construction has been demonstrated in recent years and is of interest to the paving industry because of the additional elasticity imparted to the binder. However, additional environmental benefits such as resource recovery also have been observed by creating a use, through recycling, for waste tires. Approximately 15 million tons of asphalt are laid each year in Ontario. If only 10% of this total use were laid in rubber modified asphalt concrete, it would consume all the tires that need disposal each year. Also, at a rate of only 10% of total paving, rubber modified asphalt concrete could be laid in those specific locations where its advantages would be fully realized: increased durability, reduced reflective cracking, thinner lift, and increased skid resistance.

With the increased burden placed on the national roadway system due to higher tire pressures and increased traffic volumes, there is a need to improve conventional asphalt concrete mixes. Rubber modified asphalt concrete has shown to increase durability and fatigue resistance. Its use on a widespread basis also would have the ecological benefit of recycling some of the 8 million waste tires needing disposal each year.

Each year 8 million waste tires are generated for disposal in the Province of Ontario. Historically, more than 80% of the waste tires generated were going to the landfills and over 10% were being stockpiled or illegally dumped. And, fewer than 700,000 tires are recycled into raw materials for other products each year. In 1990, the Ministry of the Environment (MOE), in an effort to reverse this trend and to find

and promote an effective means of recycling large quantities of waste tires, in as short a time as possible, funded two extensive demonstration projects that recycled the rubber from waste tires into asphalt paving mixtures in 1990.

The demonstration projects were to not only provide the Ministry of Transport answers it sought on the material's constructability, and performance, but also, answer MOE's concerns on the effects the addition of tire rubber would have on air emissions, in the production and laying of the hot mix material.

In the two demonstration projects, 18 kilometres of highway was resurfaced with rubber modified asphalt concrete. A total of approximately 100,000 waste tires had to be recycled to obtain the tire rubber necessary to complete these projects. The rubber asphalt system, which was used for these projects, and a detailed description of the system, is presented in the following sections.

Ontario Rubber Asphalt System

The Ontario rubber asphalt system is specifically designed for the Province of Ontario. The system was originally developed in 1986 by Dr. Barry Takallou. This system is referred to as the TAK System in the United States and it has been adopted by the State of New York as their accepted rubber modified asphalt concrete system.

This System was developed to attain the advantages of rubber modified asphalt concrete, but uses standard procedures and specifications, very similar to conventional asphalt concrete. Standard asphalt plants are used to produce the material, without any modification to existing equipment. It can also be laid in the same manner and with the same equipment as conventional asphalt concrete. Therefore, a traditional barrier to

the use of rubberized asphalt, specialized equipment and training, has been removed through the development of this system. In this process, the tire rubber gradation is designed to be compatible with a specific, standard dense graded aggregate gradation, and the tire rubber, is incorporated into the mixture at the rate of 1, 2, or 3 percent of rubber; or 20, 40, or 60 pounds, of whole tire recycled rubber, per ton of mixture.

The TAK System of rubber modified asphalt concrete is a whole tire recycler. The rubber used in this process utilizes all of the used tire, including, the sidewall, interliner, and tread portions, recycling all but the steel and fabric. Up to three percent or 60 pounds of rubber granules are used in the mix; requiring the recycling of 6 used tires per ton of mixture produced.

The average net yield of rubber from a used passenger tire, after steel and fabric removal, is about 10 pounds; hence, 6 tires must be recycled to acquire the 60 pounds of granulated tire rubber necessary for the production of one ton of rubber modified asphalt concrete mix. Therefore, over 7,000 used tires can be recycled per kilometre, in a two lane highway overlaid with 50 mm of rubber modified asphalt concrete pavement.

Development of the Ontario System allows the roadway agencies the benefits of using rubber modified asphalt concrete without the barriers normally associated with its use. No specialized equipment is required for production or laying the material, therefore, all current asphalt contractors can bid on projects specifying its use. There is no royalty fee involved, as with any of the patented processes, as this system was donated to the public domain. And finally, of the rubberized asphalt systems available, this process is the most cost effective, because, it requires the least amount of change from a conventional asphalt project.

Ministry of the Environment Demonstration Projects

Two demonstration projects were constructed using rubber modified asphalt concrete, funded by the Ministry of the Environment in 1990. These projects were constructed to evaluate the constructability, performance, and environmental impacts of incorporating used tire rubber in hot mix asphalt concrete.

The first project, located near Themsville, was constructed under the direction of the Ministry of Transport. This project, located on Highway 2, has 6 kilometres of rubber modified asphalt concrete and 6 kilometres of conventional asphalt concrete. The rubber modified asphalt section will be evaluated against the performance of the conventional asphalt section. Both the conventional and rubberized mixes were produced in a conventional, drum drier type asphalt plant and laid with conventional equipment. No production or construction difficulty was encountered. In 1991, as part of an ongoing evaluation of rubber modified asphalt concrete, the Ministry of Transport will recycle a portion of the rubberized section. Successful recycling of the rubberized section will remove a last concern to using the material on a routine basis throughout the Province.

The second project was constructed in the Region of Haldimand-Norfolk on Regional Roads 9 and 55, which lie within 5 kilometres of the Tyre King, tire fire site. A remediation program was established by the Ministry of the Environment for the cleanup of the Tyre King site to dispose of the approximately 50,000 unburned tires. A Public Liaison Committee, which included many of the local families affected by the tire fire, contributed to the remediation planning. They clearly expressed that a recycling solution was favourable, as it would serve both as an example of a progressive management policy, and as a guarantee that no other community would be

burdened with the 50,000 used tires. In agreement with this goal, the Region of Haldimand-Norfolk was granted approval from the Ministry of the Environment (MOE) for the second rubber modified asphalt demonstration project, to incorporate the 50,000 unburned tires into crumb rubber, to be used in the rubberized asphalt project.

The objective of the project was to evaluate the use of rubber modified asphalt concrete for use throughout the Province. The project included: removing the unburned tires from the Tyre King site, obtaining the crumb rubber from whole tire recycling, surveying the condition of the roadway prior to paving, a mix design of the rubber modified asphalt concrete to be used, construction of the actual project, environmental testing of emissions during the production of the mix and at the construction site, pavement evaluation after construction, an economic analysis of the rubber modified asphalt concrete project, and a recommendation on future use.

The experimental rubber modified asphalt project was placed in three different sections with different types of asphalt paving materials and pavement thicknesses. The purpose of this project phase was to compare, under field conditions, the mix and construction characteristics of rubber modified asphalt mixtures to the standard HL3 and HL8 wearing and base course mixtures normally used in the region of Haldimand-Norfolk. These experimental construction sections also will provide opportunities for evaluating the performance of rubber modified asphalt concrete mixes for five years under real traffic and environmental conditions. To ensure comparable and accurate results, an extensive pre-construction, roadway condition survey was performed.

The emphasis of the Environmental Evaluation during the rubberized asphalt paving project was twofold. The objective of the air emissions testing program was to compare stack emission date gathered during the production of the non-rubberized

asphalt (conventional asphalt), to data gathered during the production of the rubberized asphalt. Comparison of the emission results will determine the effect on emissions of using scrap rubber tires as a minor component of asphalt (concrete). Secondly, the Occupational Health and Safety study was to test and compare the quality of the air that plant and paving crew were exposed to, during the production, and during the laydown of rubberized and conventional asphalt. ORTECH International was contracted to perform the on site air emissions testing at Cayuga Material and Construction Co., Ltd., in Cayuga, Ontario, the contractor for the project.

The hot mix asphalt plant at Cayuga Materials and Construction Co., Ltd., consists of a conveyor which transfers aggregate (sand, stone and screenings) to a rotary drier. In the drier the aggregate is mixed and heated prior to being conveyed to a mixing hopper (pug mill) where asphalt cement is introduced and mixed with the aggregate. The asphalt mixture then is discharged from the bottom of the pug mill into dump trucks and is transported to the paving site. During the production of the rubberized asphalt, recycled tire crumb, comprising 2 to 3 percent of the total batch weight, was conveyed to the pug mill and mixed with the aggregate and asphalt cement. Emissions from the aggregate drier and the pug mill are drawn into a 120 bag baghouse prior to being discharged from the main stack which has a height of 10.9 metres above grade.

Air emission testing was conducted at the asphalt plant stack during the production of rubberized asphalt and during the production of non-rubberized (conventional) asphalt. Samples were taken from the interior of the stack at a point approximately one meter below the mouth.

The emission components included in the test program can be classified as follows:

inorganic compounds

chlorinated aromatic compounds

polycyclic aromatic hydrocarbon (PAH) compounds

volatile organic compounds

The preliminary results of the emissions testing program show no increase in emission levels beyond conventional asphalt concrete, in the production of rubber modified asphalt concrete.

In conclusion, the use of ground tire rubber as an additive in various types of asphalt pavement construction has been of interest to the paving industry because of the reported improved performance characteristics and additional elasticity imparted to the binder. Construction of the test sections provided answers to two different type questions. First, the projects allowed first hand experience with the rubber modified material, and provided the basis for a detailed economic, and technical comparative analysis, of rubber modified asphalt concrete verses conventional asphalt concrete. Secondly, an environmental evaluation was made. The projects demonstrated the viability and potential impact on waste tire disposal, that this beneficial whole tire recycling option offers. And, the extensive emission testing program, undertaken in the project, removes the concerns voiced on the potential of increased air emissions, during either production, or laydown, of rubber modified asphalt concrete. This demonstration project of rubber modified asphalt concrete, incorporating used tire rubber from over 100,000 waste tires in asphalt concrete, provides us an answer to the problem of an environmentally safe, and technologically sound, recycling method of used tire disposal.

END

THE FEASIBILITY OF IMPLEMENTATION: ACCOMPLISHMENT TO DATE IN 3R TIRE MANAGEMENT & HOW MUCH FURTHER WE CAN GO

Presentation by: *Paul Hyatt*, Tire Dealers Association of Canada

Consumers are frustrated, municipalities are frustrated, tax payers are outraged and tire dealers of this province are fed up - all due to the lack of meaningful and intelligent scrap tire recycling efforts done throughout this province.

In 1989, the Treasurer of Ontario, the Hon. Robert Nixon, introduced the atrocious tire tax of $5.00 per tire - the highest in North America - then as it is now. In his presentation to the Ontario Legislative Assembly on May 17, 1989, he stated that in "support of the Government's environmental programs the following measure(s) would be introduced. A tax of $5.00 will be charged on the purchase of each new tire. The tire tax will help fund efforts to support recycling and environmentally sound disposal." Shortly thereafter, after receiving many outraged letters of protest from consumers and tire dealers alike, claiming this tax to be nothing more than another government tax grab, Mr Nixon wrote to me stating that "the tire tax will help fund a tire disposal program now being developed by the Ministry of the Environment" and went further to say that "most people understand and support the rationale of the tire tax. Few purchasers will travel out of the province (the U.S.)to save $5 on a tire." Well Bob, -how about the thousands that now do?

I think his response just about sums up Mr Nixon's credibility and the famous Liberal attitude. Of course, now we have Mr. Bob Rae and his team as the government of the day. Has their direction been any more meaningful and responsible? Some facts should be reviewed; some solutions must be presented.

FACTS:

1. Over one hundred million dollars ($100,000,000.) has been collected in tire tax revenue over this period with not one penny being spent on short term relief for scrap tire recycling.

2. Over $100,000. of tax payer's money has been spent on a gov't commissioned Scrap Tire Study Report outlining viable sensible solutions, both short and long term, to the serious problems of tire disposal, but largely ignored by the Minister of the Environment, Ruth Grier.

3. Our Provincial Treasurer can't even identify the amount of the money collected through the tire tax from the consumer because of inept accounting procedures and a true lack of interest in the original intent for its collection.

4. Over 10,000,000 scrap tire casings pile up each year in Ontario and are becoming more of a pollutant and environmental hazard each and every day. More and more tires appear strewn on public and industrial property.

5. Municipal and provincial garbage dumps, for the most part, refuse to accept scrap tires for disposal because of imposed legislation. Our Provincial government didn't have the foresight to find suitable alternatives for disposal sites other than State-side, fields, roads, industrial areas, etc.

6. The Ontario Scrap Tire Task Force, (of which I was a member), was set up by the former Minister of the Environment. We were advised by the Minister that shipping our problems (scrap tires) outside the country was a non-solution and a relegation of our responsibilities. We agreed. Today, hundreds of thousands go south to the States, where they are recycled, re-used and reduced as a valued resource.

7. Industries in Ontario and our Provincial government purchase American crumb rubber, a product made in the United States from our recycled scrap tires, for use in manufacturing and various Provincial projects.

8. California incinerates tires as fuel to produce needed hydro power for the consumer - and they do it in an environmentally sound manner. Their air emission standards are, without doubt, among the highest in the world. Their stack emission standards (measurement of gases and other emissions escaping from the chimney stack) from this facility are <u>25% of that allowable</u> in that state, far surpassing all environmental limitations in California.

The Provincial government, after being requested, was not able to compare Ontario's air standards with those of California. The reason given at the time was that California's measurement technologies were different and our technicians didn't have the expertise to compare. (This has since been corrected and I believe comparisons have been made.)

9. Ontario has a hydro-producing plant in Wesleyville (75 kms east of Toronto) with connecting road and rail, that costs the Ontario taxpayer millions of dollars per year. It produces expense but no hydro. The original cost, at the time of the oil embargo, would be staggering even by today's standards.

With a proper and inexpensive retrofit, employment of developed scrubbers, filters and coolers, the Ontario Hydro plant at Wesleyville could consume garbage and tires while producing needed hydro from the waste resources of Ontario.

10. Valuable limited resources (gas, coal, oil) could be left in the ground for future generations while tires and garbage could become a resource - with less overall pollution and no additional heat emitted into the atmosphere.

11. Our Provincial Minister of the Environment, Ruth Grier, dubbed by some as Alice in Wonderland, is seemingly overwhelmed and directed by would-be environmentalists, well-meaning activists and garbage-rights crusaders.

12. Only one person in Ontario - our premier, Mr. Bob Rae - can end the political disputes, put science before politics and bring common sense to our disposal policies - if he thinks it's important!

13. In early 1990, the Ministry of the Environment promised a $16 million grant, with great fanfare and press coverage, to two companies in Ontario in order to recycle scrap tires - no money has yet been spent by the Ministry.

14. Cement kilns in Ontario could reduce our mounting tire piles. Their furnaces could utilize the tires' stored energy by using them as fuel and replace the limited fossil fuels that they are presently consuming. This would result in overall less pollution and heat emissions being released into our atmosphere. The kilns have not yet been granted permission for a test burn - to be done at <u>their</u> expense.

15. In addition to Nixon's misleading tire tax, tire dealers must charge a minimum of $2.00 per tire to dispose of the scrap tire. Many customers by choice, take their tire and dispose of it themselves - somewhere! With the addition of various taxes (PST, GST) the consumer pays an additional 8% on a $100. tire for a non-existant government tire disposal and recycling program.

16. Scrap tire jockeys collect tires from the tire dealer at high cost and dispose of them in various ways. Some responsible jockeys will ship them to the States where they are re-used or recycled or will send them to those landfill sites where they are still accepted. Other jockeys will "dump" them anywhere once payment is received. There is presently no control of this practice.

17. Our provincial government has done nothing to alleviate the scrap tire dilemma except to:

    a) collect over $100 million for general treasury
    b) mislead the taxpayer in their intent
    c) enact showcase committees to study the problems
    d) ignore viable, creative solutions
    e) give disposal contracts and jobs to Americans
    f) and do nothing for scrap tire disposal

18. In March, 1990, more than a year ago, the Ministry of the Environment announced the Ontario Tire Recycling Program, initially funded at $16 million, to provide among other things, support for collection, handling and sorting of scrap tires and funds to develop and implement used tire processing and recycling technologies. No monies have been diverted for this purpose, with American presentations and technology, it would seem, being given preference. Should we not create jobs in Ontario?

19. The Toronto Pearson International Airport incinerates all overseas garbage and waste to protect our Canadian ecosystems. This is done by law and is under Federal jurisdiction.

In the aftermath of the Hagersville fire, there has been a sharp decrease in the flow of scrap tires to landfill sites due in part to the fact that the collection network has ceased to function in some areas. This left tire dealers on their own to find proper and legitimate disposal methods - if any existed at all.

As President of the Tire Dealers Association of Canada and Past President of the Ontario Tire Dealers Association, we have suggested in the past and continue to stress for the future, the following steps to resolve this scrap tire dilemma. It could be called "The Rubber Resolution".

SOLUTIONS:

1. Mandatory registration of all waste haulers and tire jockeys to provide a mechanism for scrap tire control.

2. Required manifesting of all scrap tire flow. Records, manifests and performance bonds would ensure regulatory compliance and provide a basis for monitoring and enforcement. (ie. when the licensed tire collector picks up any tires, his records will eventually indicate his methods of disposal in all areas of tire recycling and disposal)

3. The Ministry of the Environment take the initiative and work with the municipalities of Ontario. They must provide partnership assurances to the municipalities in conjunction with private industry to open up and create sufficient disposal or transfer sites for scrap tires. Tire haulers must have access to these disposal sites.

4. Each disposal site should have facilities to shred tires into chips, probably raising disposal costs by $.50 a tire. These chips, which reduce the tire's volume by 75%, could be stored safely for anticipated future use as recycled rubber products, rubber asphalt or tire derived fuel. The ultimate destiny of the tires would not be for storage, but to have them ready for <u>any</u> market or use development.

5. Provide economic incentives for licensed haulers of scrap tires through direct payments. This would also ensure a secure supply of scrap rubber for processors.

6. Implementation of a system whereby documented disposal expense to tire dealers could be subtracted from the $5.00 tire tax submission. This would alleviate double billing of disposal fees to customers by the dealer and ensure that the existing government no longer misrepresents the intention of the tire tax levy.

7. Government procurement policies should be strongly implemented in various Ministries to favour products that are recycled or re-used (i.e. retread tires).

8. The hydro generating plant in Wesleyville should receive immediate attention by the Premier's Department as to the costs and viability of using all types of waste material, including tires, as fuel to generate additional hydro for Ontario and conserve our natural resources for future generations.

9. Even though value added products are the preferred option for scrap tire management in the long term, tires should be utilized as fuel in industrial applications or in tire-to-energy facilities. This can be initiated as a short term, temporary solution to the scrap tire stockpiles in Ontario and for non-recyclables after that. With closely supervised controlled burning, meeting the strictest environmental requirements, a safe and effective source of volume reduction

15. Last, but not least, our Provincial government should rise above their philosophy and ability, remove their head from the sand, seek out innovative and made-in-Canada solutions, choose viable short and long term solutions, and create industry and jobs in Ontario - and do it now.

Respectfully,

Paul Hyatt

President,
Sentry 5 Tire Stores
Tire Dealers Assoc. of Canada

Past President,
Ontario Tire Dealers Assoc.
Scarborough Chamber of Commerce

Former Member,
Ontario Scrap Tire Task Force

Waterloo Region Tire Disposal Agenda

- History
- The Problem
- The Solution
- Future Directions
- Outstanding Problems

THE FEASIBILITY OF IMPLEMENTATION
ACCOMPLISHMENT TO DATE IN SR TIRE MANA
HOW MUCH FURTHER WE CAN GO
Presentation by: Roman Martinuk, Regional Municipality of Waterloo

Waterloo Region Tire Disposal History

- Waterloo Region has 2 major tire plants
- All tires landfilled prior to 1987
- Stopped landfilling in 1987 and "started a small pile"
- In 1988 shredding and reuse on the site was experimented with.

Waterloo Region Tire Disposal
The Problem - 1989

- Large pile and growing
- No recycling activity
- Fledgeling markets
- High recycling costs
- Low tipping fee

Waterloo Region Tire Disposal
The Solution - 1989

- Request for proposals
- Budget of $280,000
- Awarded a contract at $150/tonne

Waterloo Region Tire Disposal
The Solution - 1990

- Straight tender for removal
- Budget of $552,000
- Awarded a contract at $149/tonne

Waterloo Region Tire Disposal
Haggersville

- Raised political awareness
- Increased Regional Tonnage
- Resulted in a change in fire codes

Waterloo Region Tire Disposal
Region's Response

- Contract extended to $805K from $552K
- Added security to the tire pile
- Raised tipping fees for tires at the landfill
- Clean up completed January 1991

Waterloo Region Tire Disposal
Future Direction

- Become receiver of last resort
  -encorage industry to deal direct
  -charge reasonable fees

- Eliminate tire storage
  -construction of a transfer station
  -ship frequently

Waterloo Region Tire Disposal
Outstanding Problems

- Funding
  - -Programs not geared to municipalities
  - -Public relations: $5 provincial tax
    plus $3 Regional fee
- Lack of Markets
  - -few qualified bidders (1 or 2)
  - -more compitition would be desirable

Waterloo Region Tire Disposal Summary

- History
- The Problem
- The Solution
- Future Directions
- Outstanding Problems

THE FEASIBILITY OF IMPLEMENTATION: ACCOMPLISHMENT TO DATE IN 3R TIRE MANAGEMENT & HOW MUCH FURTHER WE CAN GO

Presentation by: *Peter Martyniuk* , Canadian Auto Recyclers

GOOD MORNING LADIES & GENTLEMEN.

MY NAME IS PETER MARTYNIUK.

I HAVE HAD CONSIDERABLE INVOLVEMENT WITH WASTE TIRES - AS AN AUTOMOTIVE RECYCLER AND AS A PERSON TRYING TO FIND A SOLUTION TO THIS PROBLEM.

WHO WE ARE:

I REPRESENT A GROUP CALLED C.A.R. - CANADIAN AUTOMOTIVE RECYCLERS - WHICH IS AN AUTOMOTIVE RECYCLING TRADE ORGANIZATION FORMED ABOUT 20 YEARS AGO TO PROMOTE THE USED PARTS INDUSTRY. WE REPRESENT MOST OF THE MAJOR YARDS IN ONTARIO. WE HAVE 3 CONVENTIONS PER YEAR AND HAVE ONGOING COMMITTEES WORKING WITH GOVERNMENTS & AGENCIES WITH MATTERS SUCH AS WORKERS COMP., VEHICLE LICENSING, INSURANCE SALVAGE, SAFETY, AND GOVERNMENT INSURANCE.

WE ARE ALSO ASSOCIATED WITH S.O.A.R. (SOUTHERN ONTARIO AUTOMOTIVE RECYCLERS) WHICH WOULD COVER THE REMAINING ONTARIO RECYCLERS WHO ARE PROGRESSIVE ENOUGH TO JOIN AN ASSOCATION. WE ARE IN CLOSE ASSOCATION WITH GROUPS IN THE MARITIMES, QUEBEC, MANITOBA, ALBERTA, & B.C. - MATTER OF FACT WE HAVE OUR PRESIDENT OUT IN ALBERTA THIS WEEK FOR THEIR ANNUAL CONVENTION.

WE ARE ALSO STRONGLY ASSOCIATED WITH A.D.R.A. - (AUTOMOTIVE & DISMANTLER & RECYCLERS ASSOCIATION) WHICH IS BASED IN WASHINGTON D.C. & HAS MEMBERS WORLD WIDE. AS YOU CAN SEE OUR INDUSTRY IS VERY STRONG AND VERY INTERESTED IN CURRENT ENVIRONMENTAL PROBLEMS.

PROBLEMS:

AFTER THE HAGERSVILLE TIRE FIRE - A PIECE OF LEGISLATION - AMENDMENT 309 - WAS PASSED THROUGH LEGISLATURE IN 6 WEEKS TIME. IT BASICALLY PROHIBITS STORAGE OF MORE THAN 5,000 TIRES AT ONE SITE UNLESS A CERTIFICATE OF APPROVAL IS OBTAINED.

UP TO THE TIME OF THE FIRE A LARGE PORTION OF TIRES WERE LAND-FILLED. IN AREAS WHERE LANDFILL STARTED REFUSING THEM THE ONLY OPTION FOR OUR INDUSTRY WAS TO STORE THEM AND NOT BY CHOICE. AFTER THE FIRE, TIRES BECAME A NATIONAL PLAQUE. ALMOST ALL LANDFILL SITES NOW REFUSE TIRES - AT ANY PRICE.

AMENDMENT 309, WHICH WAS DESIGNED TO PREVENT ANOTHER TIRE KING SITUATION HAS OVERLOOKED A FEW SERIOUS PROBLEMS.

- WHERE ARE ALL THESE TIRES NOW GOING TO GO ?
- HOW ON EARTH CAN ANYONE POSSIBLY OBTAIN A CERTIFICATE OF APPROVAL TO STORE THE 9-10 MILLION TIRES ACCUMULATED ANNUALLY ?

SINCE THE HAGERSVILLE FIRE AND AMENDING LEGISLATION - MINISTRY REPRESENTATIVES AND THE FIRE MARSHALL'S OFFICE HAVE BEEN ISSUING STRICT ORDERS - OR FACE CLOSURE - TO OUR MEMBERS WHO HAVE MORE THAN 5,000 TIRES ON HAND: THEY MUST GET RID OF THEM OR OBTAIN A CERTIFICATE OF APPROVAL.

IN ORDER TO GET RID OF THEM - "WHERE ARE WE SUPPOSSED TO TAKE THEM?" - THAT'S PRETTY EASY - TO AN APPROVED SITE - A PLACE WITH A CERTIFICATE OF APPROVAL.

NO PROBLEM

I INQUIRED LAST JULY FOR A LIST OF "APPROVED SITES." I KEPT INQUIRING - BY JANUARY 91, I FINALLY RECEIVED A LIST.

IT HAD 15 NAMES ON IT. - I CALLED ALL 15 AND ASKED THEM IF THEY WERE ACCEPTING SCRAP TIRES, 9 WERE NOT ACCEPTING ANY TIRES WHATSOEVER - MOST WERE GRANTED A TEMPORARY TRANSFER SITE PERMIT IF THEY BURIED THEM IN A PRESCRIBED MANNER AND FILED A PLAN OF INTENT ON WHAT THEY WERE GOING TO DO WITH THEM.

1 WAS A LAND-FILL SITE IN SAULTE STE. MARIE - THEY WOULD ACCEPT LOCAL TIRES AT MINIMUM QUANTITIES.

2 HAD NO LISTING IN ANY PHONE BOOK AND I COULDN'T FIND THEM ANYWHERE.

1 WAS DECEASED.

1 WAS TEMPORARILY SHUT DOWN - BUT WOULD LOOK AT A LARGE QUANTITY IN THE FUTURE.

ONLY 1 WAS PREPARED TO ACCEPT ANYTIRES: HOWEVER - HE WAS IN NORTH EASTERN ONTARIO AND HIS PERMIT HAD A LIMIT OF 300,000 TIRES PER YEAR.

- NOW - WHERE DO YOU SUPPOSE 9-10 MILLION TIRES PER YEAR ARE GOING - OR SUPPOSED TO GO?

WHAT ARE WE SUPPOSED TO DO WITH THEM?.

I'VE ASKED THAT QUESTION A MILLION TIMES.

- I'VE ASKED ELECTED M.P.P.'S
- I'VE ASKED PAST AND PRESENT MINISTERS
- I'VE ASKED THE MINISTRY

THE ONLY PLACE IT GOT ME WAS AN INVITATION TO SIT ON THE "ONTARIO SCRAP TIRE TASK FORCE." I ASKED THE SAME QUESTION "WHAT IS OUR INDUSTRY TO DO WITH THEM?" THEY ASKED FOR IDEAS - WE GAVE THEM LOTS. BUT, EVERYTHING WE SUGGESTED WAS NOT ACCEPTABLE. IT DIDN'T MEET M.O.E.'S POLICY, AMENDMENT 309'S RULES, OR YOU

NEED A CERTIFICATE OF APPROVAL. THE ONLY THING POSITIVE SO FAR IS A REPORT ON SCRAP TIRE MANAGEMENT AND RECOGNIZING THE FACT THAT WE NEED SHORT TERM SOLUTIONS.

HOWEVER - WHAT IS SHORT TERM? - SINCE THE FIRE: ANOTHER 9-10 MILLION TIRES HAVE ACCUMULATED.

SOLUTIONS

-MUST BE LOOKED AT IN 2 STAGES.

- LONG TERM -

- SHORT TERM - WHICH HAS TO BE IMMEDIATE.

THE LONG TERM WILL BE DECIDED OVER A PERIOD OF TIME THROUGH NORMAL DUE PROCESS FROM THE IDEAS & INFORMATION YOU HAVE IN FRONT OF YOU.

THE IMMEDIATE SHORT TERM - WE NEED HELP!!

THERE ARE ALL SORTS OF IDEAS COMMING FORWARD FOR INTERM SOLUTIONS

- SHREDDING
- CRUMBING
- BALING

THESE WOULD REDUCE THE POTENTIALLY DANGEROUS AND UNSIGHTLY PILES TO HARMLESS AND POTENTIALLY USEFULL MATERIAL. CRUMB OR SHRED COULD BE STORED AT ENVIRONMENTLY FRIENDLY SITES. THERE IS A BALING SYSTEM AVAILABLE WHICH COULD ALSO BE USED. ALL ARE RELATIVELY INEXPENSIVE COMPARED TO WHAT IS NOW BEING SPENT ON THE STORAGE PROBLEM. THERE ARE A NUMBER OF GROUPS INTRESTED IN MARKETING CRUMB AND SHREDDED RUBBER. WE HAVE ONE SUCH CASE IN BRANTFORD. THEY HAVE THE EQUIPMENT AND MARKETS. THEY HAVE THE POTENTIAL TO RECYCLE 1 MILLION TIRES PER YEAR. BUT - THEY CAN'T GET M.O.E. APPROVAL - THE CITY DOESN'T WANT THEM AND THE

NEIGHBOURS DON'T WANT THEM - NOW WHAT? WE HAVE SUGGESTED M.O.E. INVOLVEMENT IN PROVIDING INTERM STORAGE SPACE. THIS COULD BE DONE IN CONJUNCTION WITH MUNICIPAL LAND-FILL OR SOLEY MINISTRY INVOLVEMENT. BUT, WE ARE TOLD THEY CANNOT PROVIDE SPACE OR ASSISTANCE IN STORAGE OR INSTRUCT MUNICIPACITIES TO ACCEPT TIRES. THEY TELL US THIS IS AN AREA WHICH HAS TO HANDLED BY PRIVATE ENTERPRISE.

IF THERE WAS ANY WAY THAT PRIVATE INDUSTRY COULD GET SUPPORT AND GUIDANCE, INSTEAD OF IMPOSSIBLE REQUIREMENTS, THE SHORT TERM PROBLEM COULD BE SOLVED IN NO TIME AT ALL. SOMEHOW, GOVERNMENT HAS TO RECOGNIZE, THAT, ALL WE HAVE ACCOMPLISHED SO FAR IS TO TRANSFER A PROBLEM FROM ONE AREA TO ANOTHER.

IN CONCLUSION - I WOULD LIKE TO SAY

THAT THE AUTO RECYCLING INDUSTRY AND THE NEW TIRE DEALERS ARE THE RECEIPIENTS OF ALMOST ALL THE WASTE TIRES. WE ARE NOT THE VILLANS. WE JUST HAPPEN TO BE THE END RECEIPIENTS.

THE EASIEST SOLUTION FOR US IS TO REFUSE TO ACCEPT ANY TIRES ON THE CARS WE PURCHASE OR IN THE CASE OF NEW TIRE DEALERS, MAKE THE CAR OWNERS DISPOSE OF THEIR OWN TIRES. I THINK WE ALL KNOW WHERE THEY ARE GOING TO END UP. AND THEN THEY WILL CERTAINLY BECOME A LOCAL AND PROVINCIAL PROBLEM.

AS RESPONSIBLE BUSINESS MEN AND WOMEN, WE HAVE, SO FAR, REJECTED THIS SOLUTION AS BEING IRRESPONSIBLE. BUT, WE HAVE NO OTHER AVENUE. WE HAVE A PROBLEM THAT WE CERTAINLY DON'T WANT. AND INSTEAD OF SUPPORT AND HELP WE ARE PERSCUTED. THIS IS TOTALLY WRONG. OUR INDUSTRY HAS BEEN USING THE WORD "RECYCLING" LONG BEFORE MOST PEOPLE KNEW WHAT IT MEANT. OUR

INDUSTRY IS WILLING AND ABLE TO WORK WITH GOVERNMENT.

ONE LAST THOUGHT

WHY ARE ALL THE RULES AND RESTRICTIONS DIRECTED AT USED TIRES. WHY ARE NOT NEW TIRE MANUFACTURERS STOCK PILES SUBJECT TO THE SAME RULES? IS THERE NOT MORE RUBBER ON A NEW TIRE RATHER THAN USED? WHY IS A TIRE THAT HAS GONE A FEW KILOMETERS CALLED SCRAP? I WONDER IF WE ARE NOT LOOKING THE WRONG WAY FOR A SOLUTION.

THANK YOU FOR YOUR TIME AND IF THERES ANY QUESTIONS I CAN ANSWER LATER - IT WOULD CERTAINLY BE MY PLEASURE.

THE FEASIBILITY OF IMPLEMENTATION:
ACCOMPLISHMENT TO DATE IN 3R TIRE MANAGEMENT &
HOW MUCH FURTHER WE CAN GO
Presentation by: *David Morgan*, Rubber Association of Canada

SCRAP TIRES: INDUSTRY CONTRIBUTIONS TO THE 3 R'S

Presentation to

SCRAP TIRE MANAGEMENT IN ONTARIO

TIRE RECYCLING WORKSHOP

Sponsored by

ONTARIO MINISTRY OF THE ENVIRONMENT

Markham Suites Hotel

March 7, 1991

David H. Morgan
Chairman, Task Force for Scrap Tire Disposal
The Rubber Association of Canada

SCRAP TIRES: INDUSTRY CONTRIBUTIONS TO THE 3 R'S

The Rubber Association of Canada is the national trade association of tire manufacturers and importers, general rubber products producers and importers, and their suppliers. Although an increasing number of tires are imported into Canada by other parties, members of The Rubber Association of Canada still account for over 90 per cent of tires sold in this country. In 1988, the Association's Board of Directors established the Task Force for Scrap Tire Disposal, to investigate and report on scrap tire management in Canada. Subsequently, the Task Force has worked cooperatively with stakeholders -- governments, retailers, scrap tire processors, and other interested parties -- to develop a comprehensive, environmentally responsible approach to the management of scrap tires.

Before addressing the subject of scrap tires and their management, it is useful to consider, first, a few basic truths about tires and peoples attitudes towards them.

First, people generally don't think of tires, except when the tires are not doing the job they were developed for - because the tire is flat, because the tire is not holding the road, and the person's car or truck is skidding, or because the tires are seen in a pile of scrap.

This points out that the product is a vital safety component of the vehicle. The tire producer's overriding mandate is to make a tire which is as safe and as durable as possible. This mandate comes from senior levels of government, in this country from Transport Canada. Internationally, much work has gone on to ensure that tires from any country meet the product standards of the other countries. The industry has become almost fully integrated, on a global scale, with production and wholesale shipments regularly interchanged between countries.

Finally, demand for tires in the replacement market is almost completely dependent on two factors: the number of vehicles, and the amount of driving that is being done. There is little that the tire producer could do to influence demand: as long as this society continues to endorse and encourage the automobile and the truck, as our basic modes of transportation, we will continue to generate scrap tires.

In the context of the "Three R's", the first objective is Reduction. Here, there is good news: reduction at source has already taken place, largely due to the introduction of the steel belted radial tire, which has extended the useful life of the tire approximately threefold during the past twenty-five to thirty years.

As a more recent example, consumer surveys by member companies of The Rubber Association of Canada indicate that, as the radial

portion of the replacement auto tire market has increased, over the last ten years, from approximately 65% to the current 95%, the kilometres driven before replacement have increased from about 37,000 km. to the current figure of approximately 56,000 km.. This is an increase in tread life of nearly 50% in ten years! Although manufacturers continue to invest in Research and Development to extend tread life, further significant extensions of tread life are unlikely, without implementation of an as yet unknown technology.

Since 1979, the number of cars on the road in Canada has increased nearly twenty-four per cent, yet replacement tire sales in 1990 were approximately twelve per cent lower than eleven years previously.

Correct maintenance of wheel alignment and tire pressures are areas where the individual consumer can contribute to extended tread life: Transport Canada estimates, based on parking lot surveys, are that up to 80 per cent of vehicles have underinflated tires; Rubber Association estimates indicate that tread life could be extended by up to 30 per cent with correct inflation and wheel alignment.

One final point which should be remembered is the contribution made by tires, to lower vehicle emissions. Lower rolling resistance tires have been developed over the last decade, with the objective of lowering emissions and raising Corporate Average Fuel Economy ratings for vehicle manufacturers. So tires have been contributing to the reduction of vehicle emissions, at the same time that the annual quantities of scrap tires have been reduced.

The second of the "Three R's" is Re-use, and for tires, the term Re-use includes both the activities of tire jockeys, who pick up tires from the retail location, sort and grade the tires, returning some to the marketplace as used tires, and also retreading, by tire dealers and some manufacturers. Although the market for passenger tire retreads has declined to virtually zero in Canada, the truck tire segment is active and viable, with industry estimates of equivalent numbers of new and retreaded truck tires sold annually in Canada.

The causes behind the decline in passenger tire retreading are several. First, the introduction of the steel belted radial, and subsequently the All Season tread patterns, gave the consumer not only a tire whose expected life was significantly longer, but also a tire which provided better safety, in the form of improved roadholding and handling in a broader range of conditions than previously. During the transition to these newer tires, consumer demand dropped to a very low level, and the existing retreading equipment, now obsolete, was seldom replaced.

Second, the perception that the retreaded tire is less safe than the original, which dates back to the old bias retreads, continues to exist in the consumer's mind. At current costs to remove a scrap tire from the stream, inspect it, prepare and retread it, and put it back on the market, it is extremely difficult to market the retreaded or 'remanufactured' tire at a price which is sufficiently lower than new tires that the consumer's scepticism and doubt can be overcome.

Third, there may indeed be a safety consideration which would restrict the amount of retreading which would be possible. The life of the original tire, now so much extended, implies that the casing will be much more fatigued, and closer to its maximum life. Little work has been done to estimate the possible life of the casing -- and again, the life of the casing will be significantly affected by the consumer's use, maintenance and driving experience. One of the remaining large retreaders in the U.S.A. estimates that only about 10 per cent of incoming casings are acceptable for retreading.

In summary, retreading of automobile tires appears unlikely, given the lack of appropriate equipment, lack of demand, and lack of desire, in the private sector, to invest in market segments which have no substantial demand.

Finally, the third of the "3 R's" is Recycle. There is a simplistic perception that asks why the tire industry can't melt tires down and make new ones ... similar to the way metal or glass are recycled.

Recycling of tires into tires is no longer a realistic possibility, unless an unforseen scientific breakthrough occurs. In the process of first manufacture, strong chemical bonds are formed within the rubber compounds; this process, vulcanization, is the key to the manufacture of the pneumatic tire. Just as there is no way to uncook a loaf of bread, back into flour, eggs and milk, there is no known technology which will truly 'unvulcanize' rubber back into the original, uncured components. Some reclaim processes have been referred to as 'devulcanizing' processes, but the rubber they reclaimed had different chemical properties from the original uncured rubber compounds. In the past, some use was made of reclaimed rubber compound, however the evolution of tire design, and the increasing level of quality control over the past thirty to forty years, precludes the use of reclaim in modern tires or other products subject to significant stresses. Tire manufacturers believe that a recycled tire would just not be safe --and the tire industry cannot compromise on safety.

SCRAP TIRES: INDUSTRY CONTRIBUTIONS TO THE 3 R'S

Recycling of vulcanized tire rubber depends, then, on the demand for other products, which could be made using vulcanized rubber as a component. To date, these markets have not been large enough to support a viable tire recycling industry. At a recent International Tire Recycling Conference in San Jose, California, in January of 1991, one of the speakers made the point that, for economic viability, a recycled material must do one of two things for the product it will be made into: improve product quality, or lower product cost. So far, scrap tire rubber does neither, which is the underlying cause for the dilemma of scrap tire management facing society.

THE FEASIBILITY OF IMPLEMENTATION: ACCOMPLISHMENT TO DATE IN 3R TIRE MANAGEMENT & HOW MUCH FURTHER WE CAN GO

Presentation by: *Ellen Schwartzel*, Pollution Probe

PRESENTATION TO:
TIRE RECYCLING WORKSHOP
MARCH 7, 1991

Ellen Schwartzel, Researcher
Pollution Probe

Pollution Probe has campaigned for many years for greater commitment to the 3Rs. In our view, the 3rs prescription applies to tires just as it does to any other material.

Because incineration of tires or Refuse Derived Fuel has been such a prominent theme in this workshop, I think it would be worthwhile to take a couple of minutes to explain why we oppose incineration. There are a number of reasons. The most important one deals with the value of the tire as a resource: Tires are <u>not</u> exactly the same as oil or coal, though this is often asserted. They are a complex, value-added product, the manufacture of which required energy, and undoubtedly put stress on other natural resources, including air and water. As an analogy, a dining room table is not just the same as kindling wood. And even an old kitchen table is not just the same as kindling wood. When a tire is burned, the energy and the added value that went into its manufacture is lost forever.

There are other reasons as well. We <u>do</u> have concerns about air emissions. Tires are a diverse and complex mixture of hydrocarbons, metals and small quantities of chlorine. Burning tires can be presumed to form hundreds of different combustion products. Metals are not destroyed by incineration; they are distributed to air emissions or incinerator residuals.

Trial burns are often used to attempt to convince sceptics that there is nothing to worry about. Unfortunately, we know from experience that trial burns and everyday operation are not the same thing. During trial burns, care is naturally taken to optimize all variables, such as wastefeed, temperature, oxygen flow and pollution control devices. During normal operations, upsets in one or more of these parameters can occur with distressing frequency.

It's also a fact that some of the facilities that are wanting to burn tires are having trouble meeting MOE air emission standards now. One plant was ticketed repeatedly last summer for its smoke emissions, and the Ministry has now issued a Director's Order requiring the company to install improved air pollution equipment.

Another concern we have is that in most incineration scenarios, tires would be chipped or shredded: in other words, a further energy input would be required before they are burned. The economics of this often seem to be dependent on somebody (i.e.,

government) being willing to pay to have the tires vanish.

Most of our environmental problems have arisen because we have undervalued our resources. We have been shunting goods on one-way trips through our economic systems at rates which the planet cannot sustain. Incineration finalizes that one-way trip with a burst of heat and a puff of air pollution.

If we want to get serious about environmental protection, we have to reject the concept of one-way trips for so many of our commodities. As we heard yesterday, new products for tire rubber are being developed rapidly. Rubber asphalt, sports surfaces and rubber-plastic mixtures are all likely to contribute to the solution. Some are likely to be near-term solutions. Of course, they will need market development support, including public education and government procurement policies.

In the long term, however, I'd like to hope that we can do more. Environmentalists are accustomed to suggesting outlandish, impossible things. That's our business. We suggested that lead be removed from gasoline; that CFCs be banned from packaging in Ontario; that companies like Inco clean-up their SO2 emissions. In all cases, we were told that these were impossibilities. "economically impossible." "technically impossible." "The consumer will never go for it." "International competition will kill us." But they've all happened.

The public is participating in Blue Box recycling with astonishing enthusiasm. Home composters are being snapped up as quickly as municipalities can supply them. Among Canadian families with small children, 11% use only cloth diapers. All of these phenomena, we were told, were impossible.

Now let me suggest some crazy ideas for tires. In the long-term, we should be aiming to close the loop on tires. This might involve retreading tires, or actually finding the technology to make new tires out of old rubber. In Ontario today, virtually no passenger car tires are being retreaded. But according to the retreading industry in the U.S.A., 9.5 million retreaded passenger car tires were sold there last year. Their figures indicate that retreaded passenger car tires cost 30% - 50% less than new tires, yet carry comparable warranties. According to the MOE tire report, some retreading also takes place in Japan, Germany and Sweden.

It is often suggested that retreaded tires involve some safety concerns. It would probably be worthwhile for the Province to investigate this issue through an independent study. If economics are in fact what is really preventing tire retreading on any scale, then incentives such as tax rebates might be the way to give this industry a boost, and give the consumer a broader choice.

The idea of making new tires out of old was tossed about a bit yesterday, and we were assured that tire manufacturers would already be doing this if it were possible. But as long as the prices of raw materials remain low, and they need not concern themselves with disposal costs, I don't understand where their incentive would come from.

The following quote was in the Toronto Star about one month ago:

"Industries whose products ultimately end up in the waste stream should bear some of the costs of disposing of their products."

This was not some nutty environmentalist. In fact, it was Neville Kirchmann, Canadian President of Coca Cola. I would have to agree with Mr. Kirchmann, and say that it is time that tire manufacturers (and by implication, we all as tire consumers) began to incorporate true disposal costs into the economic equation. True costs would include auditing programs, storage costs and environmental costs of Hagersville tire fires. Such calculations may make the idea of reusing the tire more appealing.

Tire manufacturers may need to change their products in order to create a reusable tire. This is no longer a revolutionary concept. BMW is now designing its cars for eventual disassembly and recycling. Whirlpool, Digital Equipment, Electrolux, 3M and General Electric are all heading in the same direction. In this decade , innumerable manufacturers are going to be accepting cradle to grave responsibility for their products. They may decide to do so voluntarily, beat the rush, and thereby increase their market share in the industry. Or they may drag their feet and be legislated. But the writing is on the wall.

Finally, let me say just a few words about reduction of tire waste. Two mechanisms need attention:

- The first is better driver education, to encourage good tire maintenance and driving habits which prolong the life of tires.

- The second has more profound implications, and much broader benefits to the environment: as a society, we should be aiming for a greatly reduced reliance on the car. A shift from the individual automobile to public transit would have a wide range of positive spin-offs, from improved air quality and reduced carbon dioxide load on the atmosphere, to fewer oil spills and more livable cities. And yes, we would be discarding fewer tires as well.

I hope this gives you a fair idea of how we view this issue. Thank you.

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April 18, 1991

Dear

Thank you for your attendance at the Tire Recycling Workshop held in March. The draft report from the workshop is now ready. I am pleased that the session was productive and that consensus was reached on most elements of a short, intermediate and long-term strategy. I feel that this was an essential step in developing a sound scrap tire management system for Ontario.

Mr. Drew Blackwell, Assistant Deputy Minister in charge of our Waste Reduction Office, has discussed the workshop recommendations with me and has consulted further with environmental groups who were not fully represented at the workshop. I regret that a response was not forthcoming on the date Mr. Blackwell indicated at the final plenary session, however, because of the complexity of the problem and the implications of each recommendation, it has been important to take two additional weeks for our deliberations.

I am in agreement with many of the workshop recommendations. Specifically, I support the short and long term proposals for managing scrap tires. In the short term, receiving facilities need to be established to accept scrap tires and store them in anticipation of end markets for recycled products containing rubber from tires. For the long term, we must support the development of a sustainable tire recycling industry that will manufacture value added products from the rubber.

For these short and long term options to be viable, we also need intermediate actions that will provide uses for large volume of crumb rubber, while markets and production capacity are developing for value added products.

Our preference is to pursue rubber asphalt technology to meet this intermediate need. Before vigorously pursuing this option, we must ensure that the rubber asphalt itself can be recycled and that the emissions from the asphalt plants do not exceed environmental standards. The recycling of the rubber asphalt will be carried out this summer with the Ministry of Transportation. As a fall back, if rubber

asphalt should not prove viable or practical, tire derived fuel will be judged on its merits as an intermediate option.

This approach is in agreement with the recommendations of the workshop, with the exception that tire derived fuel is a fall back option rather than the preferred intermediate option.

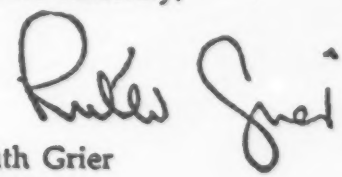
To oversee immediate actions and advise us about the implementation of this approach the Ontario Scrap Tire Task force must be continued with added input from environmental organizations, consumers, recyclers and unions. To ensure that the ideas and recommendations are heard directly from senior management staff, Mr. Blackwell will assume the role of Chairperson for the Task Force.

Discussions regarding the tire tax, approvals processes, communications plans and procurement policies are also underway with a variety of Ministries. The Task Force will address these issues as well.

I assure you that this government is committed to establishing a sound scrap tire management strategy that addresses the concerns of all stakeholders.

Again, thank you for your participation in the workshop and for making your views known.

Yours sincerely,



Ruth Grier
Minister

Attachment